

# THE IRON AGE

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## Wheel-Skids Lower Production Cost

Used to Carry Material from Railroad Cars, to Feed  
Assembly Units, to Serve Manufacturing  
Machines and as Storage Racks

BY SIDNEY G. KOON\*

**P**RODUCTION of equipment in so wide a variety that only a few units can go through on a single order, in so doing utilizing stockroom facilities reaching close to 100,000 items, is a problem not permitting the mass-production methods which have been so much in the limelight in this country in the past few years. That is the condition the General Electric Co. faces at Philadelphia, where the entire switch-gear manufacturing of the company has been concentrated. So productive have the methods devised become, however, that the assembling units have now been equipped to handle a number of different devices on each unit so that they may be kept in continuous use.

About 1,300,000 sq. ft. of floor space is available, most of it in one large structure of seven stories. Here switch-gear is made in sizes from what a man could carry readily

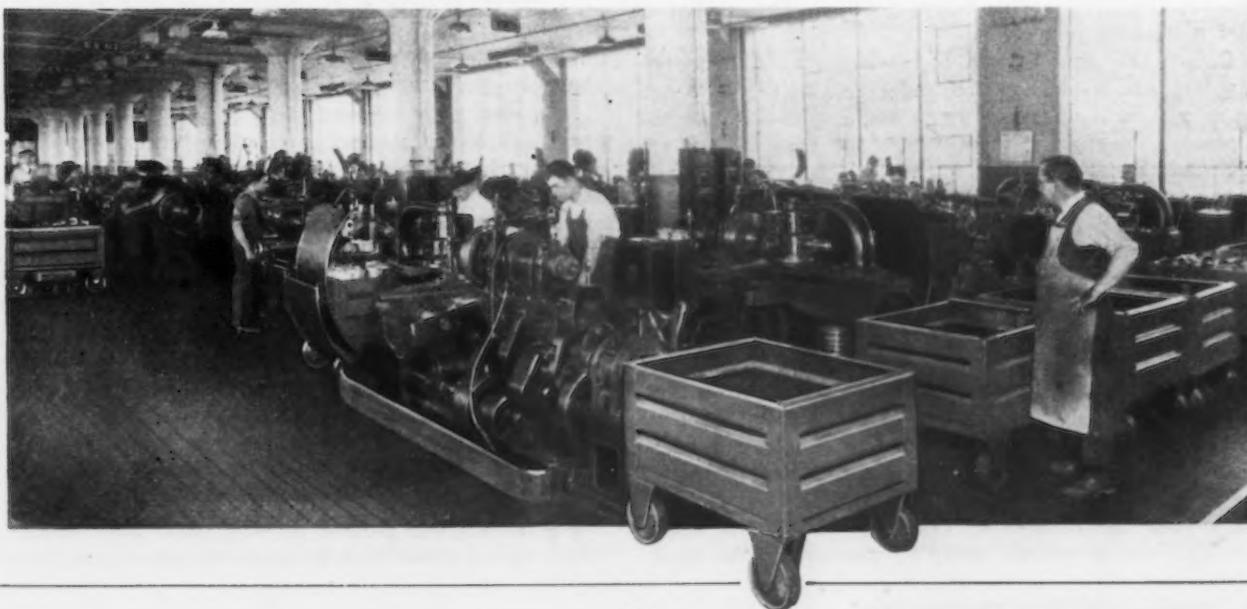
in his pocket to large outdoor units 27 ft. tall—from what would pack 300,000 in cartons in one box car to those requiring three cars for their various members.

Much lost time, handling expense and damage to parts are avoided by liberal use of wheel-skids of uniform pattern—some 2700 being employed throughout the plant. To these are added a few more, identical in design but somewhat larger, and a quota of hand-push loaders or wheels, used mainly in collecting, for assembly, items from nearby stock-racks.

Most of the standard skids are used in connection with removable bottomless boxes, in which goods are placed. But in some cases, where delicate wiring or coil wrappings might suffer from scraping against the steel sides in loading or unloading, the flat body alone is used, and means are taken to prevent the load from falling off in transit. Except where the travel is to be very short, these skids

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Use of Wheel-Skids in Screw Machine Section. At extreme left an electric lift-truck is bringing a wheel-skid to a new location, the truck platform being run in at side of skid

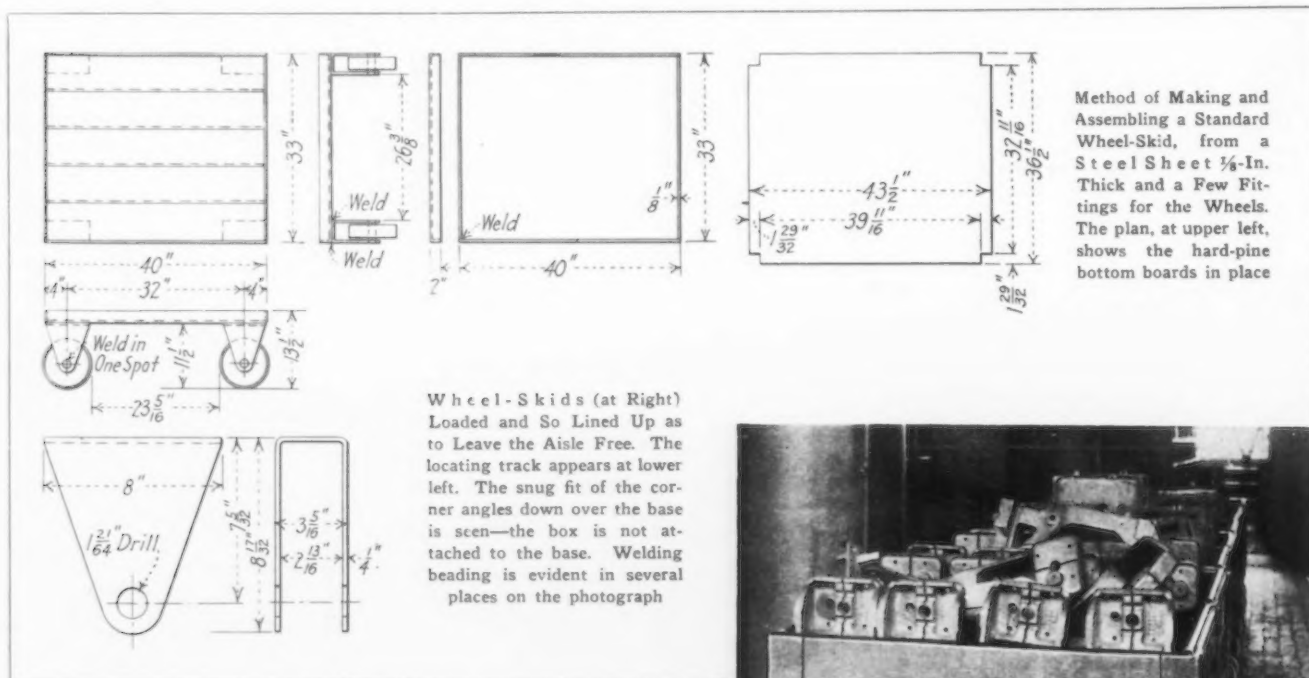


albeit on roller-bearing wheels, are handled by the customary electric lift trucks. Ordinarily the truck platform is run in between the two wheels on the same side of the skid, as this results in dropping the skid in correct position for being pushed, without turning, into the aisles between stock-racks.

In many cases, particularly in connection with the general storerooms, the loaded wheel-skids are employed as the bottom or "floor" section of the racks, being pushed into place below the lowest shelf and left as a portion of the stockroom equipment. This is especially the case on items which move with some rapidity. It avoids completely all necessity for handling of contents, thereby saving both labor cost and possible damage loss. As the

holds at the top of the box. The two corrugations or crimps, extending all around the box, provide stiffening members, so to speak, and permit the whole structure to take much more severe punishment in service than would be possible with flat sheets.

It is general practice here to use these wheel-skids for a wide variety of purposes. Not only do they receive incoming shipments from the several railroad spurs entering different parts of the plant, but they serve also as storage, either local or general, for parts so received. Two of them are placed alongside production or finishing machines, usually one on either side, and the operator takes his raw stock from one and deposits his finished pieces in the other. This conserves handling labor to the



stock-racks are open on both sides, a stop is provided, to center the skid properly under the shelf.

### How the Wheel-Skids Are Made

**S**TANDARD skids are made with a bottom section of heavy sheet steel, not only identical in thickness with the shelves in the stock-racks but also identical in shape and with the same flanged edges. In the stock shelves these pieces are placed with the flange downward. For the skids, however, they are reversed and, within the tray thus formed, is a bottom made of hard pine, bolted in place and easily renewable.

Before the pine bottom is inserted, the four wheel-trunnions are welded on the under side of the base and the wheels, built up as shown in one illustration, are put in place. The four corners where the flanges join are themselves welded and the wheel itself is a welded unit; its tread is a short piece of steel pipe. All of this work is done in one section of the plant devoted to welding—a large part of the work here being the welding of switch-gear parts.

Similarly, the box which tops the wheel skid is a welded job. This consists, again, of sheet steel of heavy gage, which has been crimped along two parallel horizontal lines, between bottom and top, and is welded to four corner angles. Two sections of pipe are welded in at opposite sides at the top, serving as hand-holds for those who have to handle the skids. The corner angles project enough below the lower edge of the sides so that they fit snugly over the corners of the base. Thus, the whole wheel-skid can be pushed easily by pressure at the hand-

with degree and has meant a saving of a great deal of needless expense.

In most places around the plant, where the wheel-skids are used in this manner, a peculiar form of stop in short sections has been set into the wood-block floor, to locate the skid positively and prevent its projection into the aisles or its being at an inconvenient position for best use of the operator. These sections of floor stops, which appear in some of the illustrations, consist of strip steel having two corrugations, one of which is much deeper than the other. The skid is pushed over the shallow corrugation so that one pair of wheels butts up against the deep corrugation and rests between the two. This locates it with sufficient accuracy for the purpose.

### Use of the Skids in Stockroom

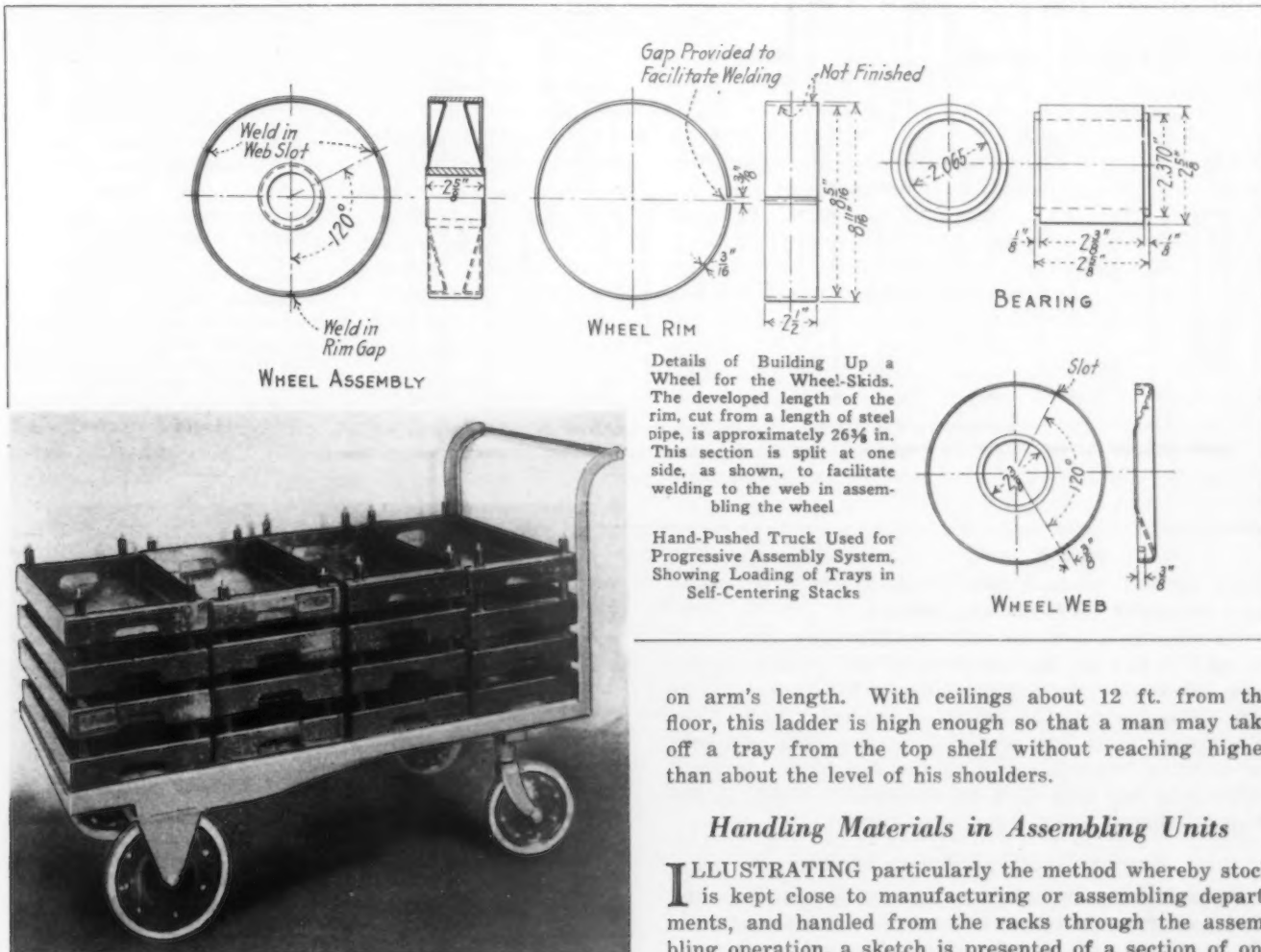
**W**HERE the skids are used in the stock-rack units, as a lower portion thereof, these same sections of stops are so placed that the skid will take its position accu-

rately and thus not project beyond the regular position assigned to it. In such cases, the lowest shelf of the stock-racks is placed 3 or 4 in. above where the top of the skid will be, thus to take care of a slight heaping of material in the skids. This heaping is discouraged, particularly where the stock is of especially heavy character, but a little leeway is allowed. The rated capacity is 4000 lb. for the standard size and 6000 lb. for the larger units.

Stock-racks not using the skids as a lower member have their lower shelves much nearer the floor. In practically all cases the stock is carried in boxes or trays made of sheet steel. As shown in illustrations, these are built up in standard sizes varying according to needs of a particular kind of stock, and with varying depths. Gen-

ible with regard to location of shelves. The framework consists of vertical steel angles with bolt-holes placed 3 in. apart, except for the lowest portion. Such stiffening as is required is furnished by the shelves themselves, which fit accurately between the angles and are bolted rigidly to them. As each shelf consists of a heavy piece of sheet steel flanged on all four sides, this stiffening is adequate. Relocation of any shelf vertically is a simple matter of unloading it, unbolting it and then bolting it in the new position.

Access to the top shelves is afforded readily by use of a step-ladder on wheels. This is non-collapsible and has enough spread to the base so that there is no danger of its tipping over, even when a man has a heavy load



Details of Building Up a Wheel for the Wheel-Skids. The developed length of the rim, cut from a length of steel pipe, is approximately 26 3/4 in. This section is split at one side, as shown, to facilitate welding to the web in assembling the wheel.

Hand-Pushed Truck Used for Progressive Assembly System, Showing Loading of Trays in Self-Centering Stacks

erally speaking, they are so designed that one man can handle the box with its contents to or from wheel-skids, either of the standard type or of the type used for gathering material for assembling work.

Each box has a place on its face for a card, indicating contents and, where it is sent into production lines, showing where it is to go, etc. Careful record is kept in each stock section so that stock may be replenished for any part as soon as it begins to show signs of depletion. This is in accordance with general good practice along this line, a different bogey having been set for each part, on reaching which point a definite amount of new stock is ordered.

Some of the switch-gear units are assembled at infrequent but somewhat regular intervals. In cases where this is placed at three months or thereabouts, special handling of stock may be required, as practically the entire stock on hand might be used at one time. Enough for the next quarterly assembling operation would then have to be ordered at once.

All of the stock-racks are so constructed as to be flex-

on arm's length. With ceilings about 12 ft. from the floor, this ladder is high enough so that a man may take off a tray from the top shelf without reaching higher than about the level of his shoulders.

### Handling Materials in Assembling Units

ILLUSTRATING particularly the method whereby stock is kept close to manufacturing or assembling departments, and handled from the racks through the assembling operation, a sketch is presented of a section of one floor of one building, on which the company has the nearest approach it makes to what we now know commonly as "mass production." Here, as in many other parts of the plant, the building is divided lengthwise into two parts not necessarily equal, wherein one part is used for the stock-racks, while the parallel and immediately adjacent part is used for the assembling or production work.

There is a narrow aisle between them, with other aisles along the windows, as shown. Back of the stock-racks, a broad aisle serves for bringing in materials to put into stock. This is done usually by electric lift trucks. On the opposite side of the building, adjacent to the assembling operations, is a conveyor for handling completed parts and delivering them for boxing and shipping.

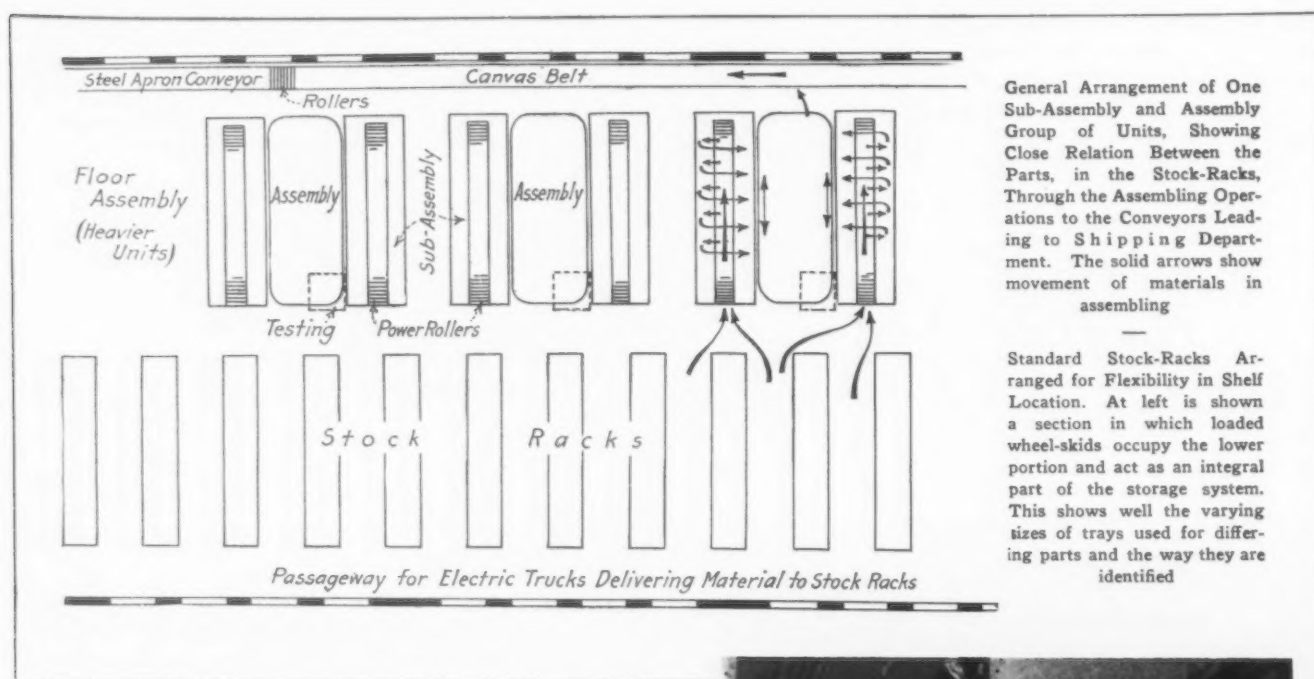
Sub-assemblies are made at one side of one of the assembling units. These sub-assemblies are then put into a general assembly at the other side. Referring to this sketch, stock taken from the racks is put on assembling skids (on wheels) and moved in accordance with the arrows, shown at the right, to the assembly unit.

Each tray is lifted in succession to the power rollers,

running down the center of the assembling tables, and when power is turned on is carried to a stop on the other end. The succession of trays carrying the different parts required thus comes within easy reach of the sub-assembly operators, standing or sitting at the outside of the unit. These operators, after having used up the materials in the boxes, put the empty boxes on a short line of gravity roller conveyors under the sub-assembly table, thus returning the boxes to the aisle. Here they are

which large switch-gears can be put together. These fixtures provide for turning the switch-gear upside down, when it is necessary to work on the opposite side, or they may be held at any other convenient angle.

Some of the boxing, particularly of small units or assemblies, is done on this same floor, for which purpose the trays are shunted off the conveyor by convenient means. Boxed goods thus prepared and assemblies which are to be boxed in the general shipping room pass from



picked up and put back into service at the point where these particular parts are accumulated.

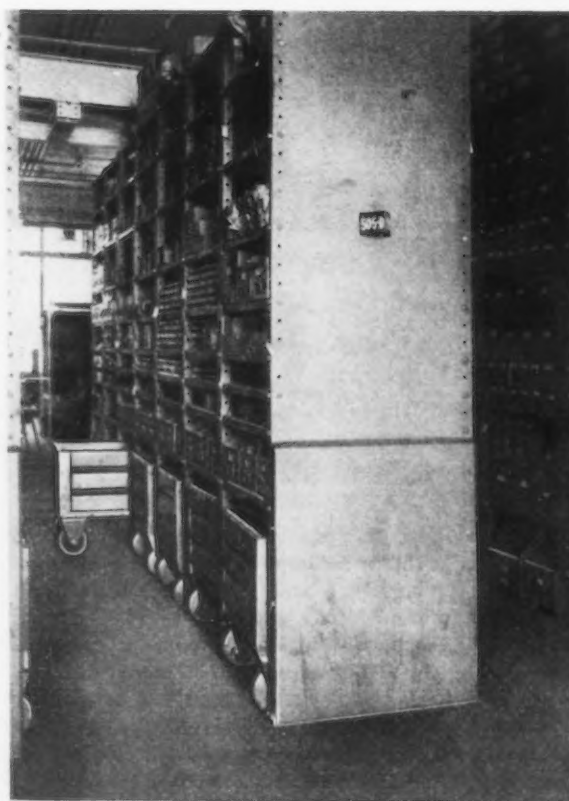
As soon as a sub-assembly has thus been completed, the unit is slid on the steel-topped table across to the other side beyond the power rollers, and the main assembling takes place in the center of the unit. It will not be necessary to go into details of the pipe rails used here for carrying fixtures on which the assembling is done. Suffice it to say that each sub-assembly is tested in the inclosure shown, before being sent further.

#### Testing Each Unit Before Shipping

Particular care is taken in connection with the electrical testing so that there is no physical contact between the assembling rails and the source of power. Inter-connecting switches are so adjusted that the section of rail holding the piece being tested must be withdrawn completely from its previous position before the current will flow. Meantime, the man doing the testing is outside the cage in which the power is applied and the door of the cage is closed. Controls operated from outside handle the entire operation, without the slightest danger to any person.

Tested devices are then placed upon the conveyor under the windows and carried toward the packing section. This conveyor consists of a broad canvas belt over the area of light assemblies. Where the pieces are individually much heavier, a steel apron conveyor is employed and the lighter parts, in trays usually, reach the steel apron section over a short run of rollers bridging the space between the adjacent end pulleys of the belt and the steel apron respectively.

It will be noted that the heaviest units are assembled on the floor, rather than in one of the assembling stations briefly described. For this purpose other interesting fixtures are in use, including a sort of A-frame on wheels, on



the end of the steel apron conveyor to a spiral conveyor which carries them down to the shipping department.

Comprehensiveness will be recognized as a feature of the system described above. Experience has, naturally, suggested a few departures from the original layout of uses for the wheel-skids, but, in the main, they function as was designed when they were first installed. And the benefits of standardization are everywhere apparent.

# How Use of Scrap Is Increasing

Old Material Consumed in 1928 Estimated at 34,000,000  
Tons, Half of It From Market—Melt Has More  
Than Doubled in 15 Years

BY CARLYLE H. STRAND

**T**HE increasing economic importance of the scrap industry may be judged from the fact that the average daily consumption of iron and steel scrap is valued at more than \$1,000,000. In this article and in the accompanying tables an attempt has been made to analyze the country's scrap in terms of production and consumption. The estimates made in some of the tables are based on the most reliable information obtainable, but are subject to variation according to actual trade conditions.

For the purposes of this analysis, scrap has been divided into two classifications—home and market scrap. Home scrap is that consumed in the plant where made. In steel plants it usually consists of butts and crops, ladle pit and runner scrap and other products incidental to steel manufacture. Market scrap is that which is purchased from outside sources. About one-half of the scrap used is home scrap and about one-half market scrap.

The railroads furnish the most desirable grades of market scrap, as it is usually heavy and well sorted. The automotive scrap as here shown includes scrap made at automobile plants as well as worn-out cars. This latter grade returns to market in a comparatively short time. Collection of country scrap by junk men probably amounts to about 20 per cent of the total supply, both home and market scrap. An accompanying table gives an analysis of scrap supply and consumption by industries.

## Production and Consumption by Districts

Another table gives an analysis of scrap production and consumption by geographical districts. In this table the production of market scrap has been based mainly on population, while the production of home scrap and the consumption of both kinds is based on the production of

steel, pig iron, iron and steel castings, etc. Exceptions have been made in instances where special conditions are known to prevail, such as an unusually large scrap supply in Michigan due to automobile manufacture and abnormally great consumption in the Chicago district due to the many steel foundries, bar rerolling mills, etc., in addition to the large steel plants.

Such districts as New England, the Northwest, Southeast, South Central States and the Pacific Coast have an overabundance of scrap, while the great steel manufacturing belt of the Northeast and North Central States is deficient in supply, giving strength to these markets. It is probable that the actual scrap production of the Southeast and South Central districts is not as large as is indicated in the table of geographical production, as railroads, building construction and other industries have not kept pace there with increase in population. These districts, however, are developing rapidly and will probably prove to be increasingly important potential sources of supply. Transportation costs to principal scrap consuming centers are the stumbling block at the present time.

Various observers have from time to time made estimates of scrap consumption in the United States. To bring these estimates up to date and to make use of a more uniform method of estimating, there has been compiled a tabulation of scrap consumption by various branches of the iron and steel industry. This is given in an accompanying table. The data are based largely on production statistics of the American Iron and Steel Institute. It was, of course, necessary to make many assumptions, and the results necessarily are only approximate. The methods of determining the consumption of

**F**OLLOWING his graduation from the Case School of Applied Science, Cleveland, with degrees of bachelor of science and metallurgical engineer, Carlyle H. Strand took post graduate work in metallography at Harvard University under Prof. Albert Sauveur and Prof. H. M. Boylston. His practical experience has consisted of work in the metallurgical department of the Illinois Steel Co., in the test department of the Pennsylvania Railroad, as chief metallurgist of the Crown Cork & Seal Co., Baltimore, as senior inspector for the Bureau of Aircraft Production during the war, as metallurgist with the United States Bureau of Standards, as assistant chief inspector of Lackawanna Steel Co., Buffalo (now Bethlehem Steel Co.), and metallurgist and chemist for the Ohio Forge Co., Cleveland. He is the author of the Bureau of Standards technologic paper on "Cast Iron for Locomotive Cylinder Parts," and in 1914 published a paper on "Heat Treatment of Open-Hearth Steel Castings" in conjunction with C. D. Young and O. D. A. Pease in the proceedings of the American Institute of Mining Engineers. His address is 1135 Sixteenth Street N. W., Washington.



### Analysis of Scrap Supply and Consumption by Industries (1928)

Scrap Supply			Scrap Consumption		
Source	Long Tons	Per Cent of Total	Consumption in	Long Tons	Per Cent of Total
Home scrap	17,000,000	50	Steel making	25,000,000	72
Steel mills	14,300,000	42	Blast furnaces	4,000,000	12
Foundries	2,700,000	8	Iron foundries	3,700,000	12
Market scrap	17,000,000	50	Rail rerolling mills	1,000,000	3
Railroad	5,400,000	16	Other industries	300,000	1
Automotive	3,700,000	11			
Building and construction	3,100,000	9			
Oil, gas, water and mining	1,700,000	5			
Agricultural	1,000,000	3			
Machine shop	700,000	2			
Miscellaneous	1,400,000	4			
Total, home and market	34,000,000	100	Total, home and market	34,000,000	100

### Analysis of Scrap Production and Consumption by Districts (1928)

DISTRICT	SCRAP PRODUCTION				SCRAP CONSUMPTION	
	Market, Gross Tons	Home, Gross Tons	Total, Gross Tons	Per Cent of Total	Total, Home and Market, Gross Tons	Per Cent of Total
New England <sup>1</sup>	1,200,000	100,000	1,300,000	3.8	200,000	0.6
Northeast	5,400,000	11,200,000	16,600,000	48.8	22,200,000	65.6
Del., D. C., Md.	400,000	400,000	800,000	2.4	1,000,000	2.9
New Jersey	600,000	200,000	800,000	2.4	100,000	0.3
New York	1,600,000	700,000	2,300,000	6.7	1,500,000	4.4
Ohio	1,000,000	3,800,000	4,800,000	14.1	7,600,000	22.3
Pennsylvania	1,500,000	5,700,000	7,200,000	21.2	11,400,000	33.5
West Virginia	300,000	400,000	700,000	2.0	700,000	2.3
North Central	3,800,000	4,500,000	8,300,000	24.5	8,900,000	26.3
Illinois	1,100,000	2,000,000	3,100,000	9.1	4,100,000	12.2
Indiana	500,000	2,100,000	2,600,000	7.7	4,200,000	12.3
Iowa	300,000	.....	300,000	0.9	.....	.....
Michigan	1,000,000	200,000	1,200,000	3.5	200,000	0.5
Minnesota	400,000	100,000	500,000	1.5	200,000	0.7
Missouri	300,000	.....	300,000	0.9	100,000	0.4
Wisconsin	200,000	100,000	300,000	0.9	100,000	0.2
Northwest <sup>2</sup>	1,000,000	300,000	1,300,000	3.8	600,000	1.7
Southeast <sup>3</sup>	1,900,000	600,000	2,500,000	7.4	1,200,000	3.6
South Central <sup>4</sup>	2,800,000	100,000	2,900,000	8.5	400,000	1.3
Pacific <sup>5</sup>	900,000	200,000	1,100,000	3.2	400,000	0.9
Total	17,000,000	17,000,000	34,000,000	100.0	34,000,000	100.0

<sup>1</sup> Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

<sup>2</sup> Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, North Dakota, South Dakota, Utah and Wyoming.

<sup>3</sup> Alabama, Florida, Georgia, North Carolina, South Carolina and Virginia.

<sup>4</sup> Arizona, Arkansas, Kentucky, Tennessee, Mississippi, New Mexico, Oklahoma, Louisiana and Texas.

<sup>5</sup> California, Oregon and Washington.

### Price Analysis of Various Grades of Iron and Steel Scrap Quoted in The Iron Age

Commodity	F.o.b.	Average 10-Year Post-War Price, per Gross Ton	Ratio to Heavy Melting Scrap, Pgh., Per Cent	Present Price, per Gross Ton <sup>1</sup>	Ratio to Heavy Melting Steel Scrap, Pgh., Per Cent
Pig iron:					
Basic pig iron	Philadelphia	\$25.08	+38	\$19.75	+ 3
Basic pig iron	Valleys	23.44	+29	17.50	- 9
Scrap:					
Low phos. billet and bloom crops	Pittsburgh	22.40	+24		
No. 1 machinery cast	Chicago	21.52	+19	17.64	- 8
No. 1 machinery cast	Cincinnati	21.20	+17		
No. 1 machinery cast	Philadelphia	20.70	+14	16.25	-16
Old cast iron carwheels	Philadelphia	20.65	+14	16.50	-14
No. 1 cast cupola	Pittsburgh	20.08	+11	16.00	-17
Old cast iron carwheels	Chicago	19.80	+ 9	14.00	-27
No. 1 railroad wrought	Philadelphia	19.64	+ 8	15.50	-19
Railroad malleable	Chicago	18.89	+ 4		
Old steel rerolling rails	Chicago	18.71	+ 3		
Steel knuckles and couplers	Chicago	18.53	+ 2		
Heavy melting steel	Pittsburgh	18.13	0	19.25	0
No. 1 railroad cast	Cincinnati	18.01	- 1		
No. 1 railroad wrought	Chicago	16.61	- 8	14.84	-23
Heavy melting steel	Philadelphia	16.35	-10	16.00	-17
Compressed sheets	Pittsburgh	16.33	-10		
Heavy melting steel	Chicago	15.73	-13	14.75	-23
Cast iron borings	Pittsburgh	13.89	-23		
Machine shop turnings	Pittsburgh	12.77	-30		
Cast borings	Chicago	11.45	-37		

<sup>1</sup> From THE IRON AGE, Jan. 17, 1929 (prices as of Jan. 15).

scrap by the various branches of the iron and steel industry are shown as follows:

(1) *Steel manufacture.*—There is approximately an 11 per cent melting loss in manufacturing steel ingots from pig iron and scrap. This is due to oxidation of metalloids in pig iron and scrap, iron loss in slag, steel loss in tapping and teeming, and to a lesser extent the physical loss of light scrap through the checkerwork and stack. The data in the first column therefore were obtained by dividing the annual production of steel ingots and castings by 0.89, giving the total pig iron and scrap charged. From this was deducted the combined annual production of basic, Bessemer and low phosphorus pig iron, the steel making grades. The result is the scrap used in steel manufacture. The figure of 11 per cent melting loss, strictly speaking, applies only to open-hearth steel manufacture, but as this is so large a percentage of the total it was thought that no serious error would be incurred by assuming the same loss for all steel manufacturing processes.

(2) *Blast furnaces.*—In the manufacture of pig iron in blast furnaces there has been a large increase in the use of scrap. Amounts of scrap used in blast furnaces as shown in the preceding table were obtained by the use of the following percentages: 3 per cent of total pig iron production prior to 1915; 6 per cent from 1915 to 1923, inclusive; and 10.5 per cent from 1924 to date. There has been a considerable increase in the amount and proportion of scrap used in blast furnace burdens in recent years.

(3) *Iron foundries.*—Gray and malleable iron foundries, it is estimated, used scrap to the extent of about 30 per cent of combined foundry and malleable pig iron production prior to 1915 and about 50 per cent from 1915 to date. This illustrates the manner in which compilations were made under this caption.

(4) *Rail rerolling mills.*—About 1,000,000 tons of old rails are rerolled annually into smaller rails, reinforcing bars or other products. The manner of obtaining these figures was to take the ratio of this amount to recent annual average rail production and applying the same percentage, which amounts to 35 per cent of annual rail production from 1915 to date. Twenty per cent was used

### Estimated Domestic Scrap Consumption

(Millions of Gross Tons)

Year	In					Total
	Steel Manufacture	Blast Furnaces	Iron Foundries	Rail Rerolling Mills	Miscellaneous Processes	
1900	2.4	0.4	1.0	0.5	0.8	5.1
1910	9.0	0.8	1.8	0.7	0.8	13.1
1911	8.7	0.7	1.5	0.5	0.7	12.1
1912	12.0	0.9	1.8	0.6	0.8	16.1
1913	11.0	0.9	1.9	0.7	0.8	15.3
1914	8.9	0.7	1.6	0.4	0.6	12.2
1915	12.5	1.9	2.8	0.7	0.7	18.6
1916	16.0	2.4	3.2	0.9	0.9	23.4
1917	19.2	2.4	3.2	1.0	1.0	26.8
1918	18.3	2.4	3.1	0.8	0.8	25.4
1919	14.5	1.9	3.0	0.7	0.6	20.7
1920	18.5	2.3	3.6	0.9	0.7	26.0
1921	8.9	1.0	1.5	0.7	0.3	12.4
1922	18.3	1.7	2.5	0.7	0.5	23.7
1923	19.0	2.5	4.0	1.0	0.5	27.0
1924	18.4	3.3	3.3	0.8	0.4	26.2
1925	22.0	3.9	3.5	0.9	0.4	30.7
1926	23.1	4.1	3.6	1.0	0.4	32.2
1927	22.0	3.8	3.6	1.0	0.3	30.7
1928 <sup>1</sup>	25.0	4.0	3.7	1.0	0.3	34.0

<sup>1</sup> Preliminary figures.

prior to 1915. In both instances, renewed and rerolled rails were deducted from the annual rail production before making computations.

(5) *Miscellaneous processes.*—The principal item under this heading consists of scrap used in the manufacture of wrought iron. Lesser amounts of old axles, tires, and similar products are forged or rolled annually into various products and are included in this estimate. The figures are in approximate constant relation to annual production of rolled iron, as it was believed that this would give the most accurate picture of the situation.

### Pig Iron and Steel Production Compared with Scrap Consumption

An interesting analysis of the iron and steel industry, showing its relation to increasing scrap consumption over a period of more than a quarter century, here is shown.

Year	Total Pig Iron Production, Gross Tons	Total Production of Steel Ingots and Castings, Gross Tons	Estimated Total Scrap Consumption, Gross Tons	Estimated Scrap Consumption in Steel Making, Gross Tons
1900	13,459,480	10,188,329	5,100,000	2,400,000
1913	30,618,169	31,300,874	15,300,000	11,000,000
1928 <sup>1</sup>	38,000,000	51,650,000	34,000,000	25,000,000

<sup>1</sup> Preliminary figures.

It will be noted from the preceding tabulation that in

1900 more pig iron was produced than steel, while in 1928 the situation was reversed. It is also apparent that, while steel production increased five fold in this period, the use of scrap in steel making increased ten fold; during the same interval consumption of scrap of all kinds increased nearly seven fold. On the other hand, less than three times as much pig iron was produced in 1928 as in 1900.

A very unusual situation has recently existed in the Pittsburgh district, with heavy melting scrap quoted higher than basic pig iron. The firm prices

### Analysis of Scrap Consumption in Basic Open-Hearth Process

(Millions of Gross Tons)

Year	Scrap Used in All Steel Making Processes	Scrap Used in Steel Making Processes Other Than Basic Open-Hearth	Scrap Used in Basic Open-Hearth Process	Basic Pig Iron Production	Total Pig and Scrap Used in Basic Open-Hearth	Per Cent Scrap of Total	Price of Heavy Melting Steel Scrap, <sup>1</sup> Pgh.
1910	9.0	0.6	8.4	9.1	17.5	48	\$15.34
1911	8.7	0.5	8.2	8.5	16.7	49	12.98
1912	12.0	0.6	11.4	11.4	22.8	50	13.66
1913	11.0	0.7	10.3	12.5	22.8	45	12.92
1914	8.9	0.5	8.4	9.7	18.1	46	11.50
1915	12.5	0.8	11.7	13.0	24.7	47	13.23
1916	16.0	1.1	14.9	17.7	32.6	46	18.14
1917	19.2	1.2	18.0	17.7	35.7	50	29.90
1918	18.3	1.2	17.1	18.7	35.8	48	28.95
1919	14.5	0.8	13.7	14.5	28.2	49	18.35
1920	18.5	0.8	17.7	16.8	34.5	51	25.74
1921	8.9	0.3	8.6	7.8	16.4	52	13.76
1922	18.3	0.8	17.5	13.8	31.3	56	17.62
1923	19.0	0.9	18.1	19.8	37.9	48	20.38
1924	18.4	0.7	17.7	16.0	33.7	53	18.51
1925	22.0	0.8	21.2	19.7	40.9	52	18.60
1926	23.1	0.8	22.3	21.2	43.5	51	17.10
1927	22.0	0.7	21.3	19.4	40.7	52	15.50

<sup>1</sup> From THE IRON AGE.

for heavy melting steel scrap recently are accounted for by the high rate of steel production and the increased consumption of scrap in basic open-hearth furnaces.

An analysis of scrap consumption in the basic open-hearth process, together with prices for heavy melting steel scrap, is given in an accompanying table. The figures in this table merely substantiate the generally known

fact that scrap proportions increased during and since the war. The decrease to 48 per cent in 1923 is probably accounted for by the high rate of steel production and the shortage and high price of scrap during that year. While steel production was still greater in 1926, the price of scrap was easier and more scrap was used, although there was a slight recession in the proportion for that year.

## Advisory Department Assists Employees

Crane Co. Helps Workmen Solve Intra and Extra-Plant Problems—Handles Accident Claims and Cases of Wage Assignment

TO bring management into closer touch with employees, Crane Co., Chicago, operates an advisory department, which is in charge of a member of the Crane Veteran League who has been with the company more than 35 years. This man was chosen not alone because of his long service with the company, but also because of his personal acquaintance with hundreds of the shop men, together with the fact that he has had a great deal of experience with both men and women in personnel work, in the Young Men's Christian Association and in church circles.

As head of the advisory department he comes face to face with from 6000 to 8000 men and women during the period of a year and helps them to solve their personal troubles. Each case brought to the attention of the adviser is considered on its own merits in the privacy of an office built especially for this purpose. The employee is advised as to the best course to follow to get him out of his difficulties, regardless of whether they be family or financial troubles or pertain to conditions in the shop.

Foremen are instructed to watch the behavior of workmen, especially their attitude toward their work. Ordinarily a man does not lose his energy, and show signs of worry to the point where it is plainly noticeable and where he may become a burden to his department, unless there is some real underlying cause. It is the foreman's duty to refer cases of this kind to the adviser. If it is a case of a broken home, the adviser brings man and wife together and openly reviews their differences in a careful and friendly manner. A reunited family is almost invariably the result, and, best of all from the company's viewpoint, the employee is enabled to hold his job and is once more contented.

Interest in family matters does not cease at the time of a worker's death. The widow is welcome to advice. She is given aid in gathering and safeguarding papers relating to her husband's estate. The department protects her from unscrupulous advisers, whether they be friends, relations or lawyers, by placing her affairs in the hands of a reliable attorney. When children are left orphans, efforts are made to bring about adoption.

Personal acquaintanceship with attachés of the juvenile court and juvenile detention home often smooths the way for parents whose children have become wayward.

When investigation reveals that families are living in dark and gloomy quarters, arrangements are made so that they may move into more suitable apartments or homes.

When a police officer appears with a warrant for the arrest of one of the employees, the family or friends are notified to arrange for proper bail and an attorney is secured to protect the employee's interests.

All difficulties arising from wage assignments and garnishees are referred to this department. This practice not only results in satisfactorily settling many disputes

and claims, but it also affords to the workman the knowledge that he has a reliable and unprejudiced source of advice, which will aid him in avoiding future entanglements of a like kind. A frank statement of facts by the adviser often results in the cancellation of partial payment contracts, which at times are obviously unfair to the buyer because of changes in conditions beyond his control.

Ways and means are suggested to reduce personal debts and a plan has been put into action whereby stock certificates, valuable papers and securities of different kinds are put away for safe-keeping in one of Chicago's largest banks, with no charge whatsoever to the employee.

The department offers aid when employees' savings are threatened. A workman may lend a life's accumulation to a friend on a personal note to buy a home, pay a mortgage or a doctor's bill, only to find that the money is not forthcoming when the loan matures. Such a case is taken up by the adviser, who follows it through without the expense of legal action, usually effecting a settlement satisfactory to all concerned.

Foreign born who are still aliens are urged to take out naturalization papers.

Arrangements have been made with a large insurance company whereby a blanket policy has been issued to cover personally owned cars of workmen at a low rate. Close to 800 employees have availed themselves of this opportunity. To shelter employees' cars, hundreds of steam-heated stalls have been erected, and gasoline and oil are dispensed at cost plus overhead charges.

Often employees meet with street car accidents, automobile accidents and the like. Crane Co. maintains friendly relations with the claim departments of the street car company, taxicab companies and insurance companies. Adjusters work through the adviser, and claims are settled without legal cost to the employee or loss of working time.

When personal disputes arise in the shop, the men involved are brought together in the adviser's office in an effort to reestablish friendly feelings.

Some time ago the president of the company, R. T. Crane, Jr., owned a number of vacant lots in the neighborhood of the plant. He deeded them to the adviser with instructions that they be sold to old employees on the condition that they be used as home sites. Every lot was sold at a reduced price with taxes paid in full. A standing policy of the department is to encourage employees to own their homes, and they commonly consult the adviser on their real estate problems. At the present time 30 to 35 per cent of all the employees in the Chicago plant own their homes.

Employees are showing a hearty appreciation of the advantages of the new department. In steadily increasing numbers, they are bringing their problems to the adviser, whether they arise in or outside of the plant.

# Welded Steel Replaces Wood

Economies Result When Steel Replaces Wooden Reels and "Beams" Used in Textile and Wire Industries—Sizes Range from 1½ In. to 10 Ft. Diameter

**Y**ET another instance of the way welded units of pressed steel gain footholds in important industries is found in the manufacture of spools, bobbins, beams and reels. Such carriers for thread, braid, wire and woven fabrics are known by these and other names, but all are essentially spools, of diameter and length ranging from 1½ in. to 10 ft., according to the purpose intended. Up to a few years ago all those used in the textile industry were made of cast iron or wood; even where some device was needed to prevent overwinding or to act as a drive, ratchet teeth would be cut into the wood on one end (if the bobbin were of moderate size), or driving gears of cast iron would be bolted or cast to the ends of the longer "beams."

Certain well known disadvantages of wooden carriers were endured because no solution was apparent. Not only did the wooden teeth wear out rapidly, and the cast iron beam-ends break under rough handling, but when splintering started on the wooden spools the yarn would catch and either break or cause a rough imperfection in the woven fabric.

Such troubles are cured by the use of steel spools, according to the experience of the Mossberg Pressed Steel Corporation, Attleboro, Mass., which has specialized since 1920 in such products. Much textile machinery is equipped with all-steel beams, and a considerable volume of business in beam ends comes to this concern from plants needing replacements for broken cast iron parts. These beam ends are of infinite variety—each loom designer seems to have his own ideas about the best way to support and drive these fixtures; replacement work is consequently of the "tailored-to-order" nature. Sheet steel and plate of



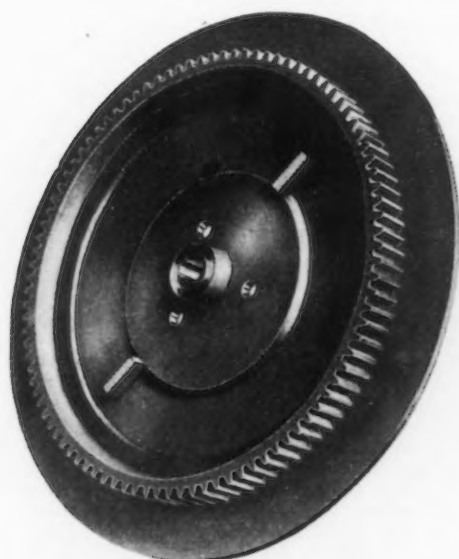
7-Foot Vulcanizing Reel, All-Welded Construction. Barrel extends through end and fillet welded to form stiff rim; arms of channel iron; shaft and diagonal braces of tubing

correct gage, cut in circles or bent and welded into short cylinders, appropriate shafting and semi-steel gear rings form the elements from which any such design can be duplicated in relatively indestructible construction.

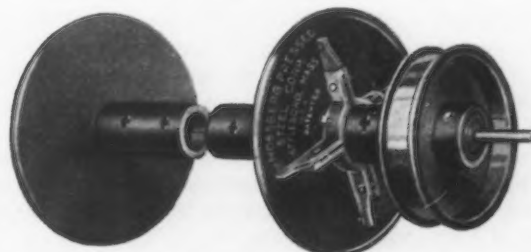
Should a loom beam filled with yarn be dropped and one of the heads broken, serious loss occurs, oftentimes to the entire amount of yarn. Steel construction removes this risk. In many cases the steel heads can be made considerably lighter. This is particularly desirable in section beam heads, which may be filled with yarn and then transported oftentimes a long distance from one mill to another. The extra weight in the cast-iron beams shipped back and forth totals a big expense item, even if no damage is done en route. Steel also takes a different freight classification and a lower rate.

Quantity production of various sized reels is a more important output of the Mossberg plant, the wire industry being among the largest users. Even small bobbins and "cop holders," all steel, have replaced wooden ones economically; steel spools have smaller barrels and thinner ends and can carry more thread or wire, and thus compensate for freight on the slightly greater weight.

Construction details on reels and spools vary according to use. Circular ends usually are curled or flanged at the edges for stiffness; larger sizes have radial ribs pressed into them for lateral strength. Small barrels may be made of tubing; larger ones are bent from a flat sheet



20 In. Loom Beam Head. Semi-steel gear, bar steel center bushing, friction band and plate of sheet steel, all welded into one homogeneous unit



All-steel Beam with Adjustable Heads. Barrel of steel tubing with inserted steel ends, welded in place; hubs made of bar stock, clamps bent to shape, one end welded to head, the other end drawn up by clamping screws

and welded at the longitudinal seam. They are affixed to the ends in various ways; the smaller ones may have projections fitted into slots in the circular ends and clinched over or headed. Larger reels are welded in all joints. If a smooth joint is required, a fillet weld is run around between barrel and head and machined. Welding is a method of construction such that hollow shafting, special reinforcing pieces or braces can easily be added as the requirements of the design demand. Skeleton construction, with barrel made of perforated plate, is especially desirable in the wire industry, for annealing, impregnating or saturating purposes, where the mass of the reel

should be reduced to the minimum and the fullest opportunity given for the heat or fluid to penetrate into the coils.

Steel construction has several collateral advantages: Beam barrels made of steel tubing have the advantage over wood in that a steel barrel will remain straight and true to dimensions, whereas wood will warp even if it does not get battered or damaged in handling. It is possible to use a barrel of smaller diameter when made of steel, and thus the beam will carry more yarn. This particular feature is of special advantage in the carpet weaving industry and in the plush mills.

## Electric Heat Treating May Shortly Expand in England

Dealing with the subject of the speeding up of engineering production, A. R. Page, of the metallurgical department of the Birmingham Small Arms Co., Ltd., Birmingham, England, in his presidential address to the members of the Birmingham Metallurgical Society late last year, pointed out that the heat treatment of carbon tool steels is a very important operation. The high temperatures necessary in correct hardening are difficult to control and, even if satisfactorily obtained, they are not easy to measure accurately.

The most popular method of heating is a gas-fired furnace, said Mr. Page, but this is actually the least satisfactory. The advent of electricity has placed in the hands of the engineer two methods of hardening—the salt bath method and what he termed the “dry” electric furnace—which provide extremely accurate control of temperature and ease in measurement.

That the utilization of electricity for industrial heating has got to come, even in Great Britain, appears to have substantial reasons for belief, said the speaker. For very large heating installations it is probable that gas, oil or solid fuel will hold its own, but based on the industrial cost of gas and electric power in Birmingham for furnaces of moderate size, electric heating not only affords many advantages in operation and improvements in the quality of the product, but it is actually cheaper, taking all things into consideration, than any other methods of heating.

## Stability of Metals at High Temperatures Decreases Under Load

Methods of testing steel pipe to rupture at elevated temperatures were described in a paper, “Evaluation of the Stability of Metals at Elevated Temperatures from Expansion and Short-Time Tensile Test Data,” by Prof. Albert E. White and Claude L. Clark, University of Michigan, Ann Arbor, read Oct. 12 at a session of the American Society for Steel Treating, at the convention in Philadelphia.

Slides were presented showing curves plotted from observed data. It was found that the destruction of the pipe proceeded rapidly when its load was enough to subject it to heavy tensile stress. But at about 3000 lb. to the square inch a pipe at 1250 deg. Fahr. had run more than 2250 hr. without showing distress.

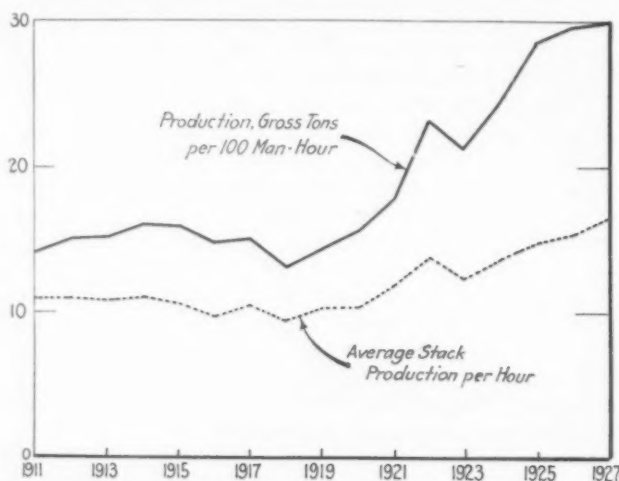
As a result of the experiments, however, the authors concluded that the formula commonly used for such a case is unreliable. From the formula, the “curves” should be straight lines, which they are not.

With the great variety of engineering steels now available, said one speaker, in discussing the paper, one must (1) choose the one best suited to the purpose, and then (2) use a safe working stress on the material chosen, under the conditions of temperature, etc., to be met. He

did not agree with the adequacy of the authors' test methods and did not believe them suitable for the purpose intended.

## Productivity in Merchant Blast Furnaces

Labor productivity in merchant blast furnaces was more than twice as great in 1927 as in the pre-war period, according to an investigation by the United States Bureau of Labor Statistics. Average output of pig iron per 100 man-hours of labor increased from 14 gross tons in 1911 to 30 tons in 1927. In other words, it required 7 hr. 7 min. of labor to produce a gross ton of pig iron in the pre-war period, against 3 hr. 20 min. in 1927. This increase in productivity, which has taken place almost en-



Both the Furnaces and the Men Have Shown Improvement in Performance

tirely in the past six years, is due in large part to closing down many inefficient plants, owing to keen competition of steel works furnaces.

## Japanese Opinion on Density of Quenched Steels

Based on a study of the density of quenched steels, the results of which are found in a paper contributed to a recent issue of “Science Reports” of the Tôhoku University of Japan, the following conclusions are arrived at by the author, S. Sekito:

The expansion of quenched steels may be explained by the expansion of the space lattice.

The internal stress calculated from the diffusion of the spectral lines of quenched steels was shown to be of the same order of magnitude as the tensile strength.

The plane at right angles to the plane of maximal atomic density (the most easily slippable plane) is subject to the greatest internal stress.

Prof. Honda's explanation of the diffusion of the spectral lines in quenched steels is more reasonable than that of Westgren, who considers it as due to the refinement of the crystal grain.

# Axle Housings of Electric Steel

## How a California Foundry Overcomes Defects in Nickel Alloy Castings—Composition and Heat Treatment

BY ETHELBERT FAVARY\*



WHEN it was difficult to obtain steel castings from the East during the war, the company with which I am connected built its own electric furnaces from the specifications furnished by C. H. Vom Baur, New York. In this type the direct arc with a non-conducting hearth is used. Three-phase alternating current is employed with

three carbons entering the furnace. The larger, 3-ton, furnace is provided with automatic regulation of the arc; the smaller, 1½-ton, furnace is hand regulated.

Due to low cost of the electric current on the Pacific Coast, the cost for small furnaces is very low indeed. It is, however, necessary that the man in charge have a thorough knowledge of the electric furnace process. In order to produce good sound steel, it is necessary that the metal does not contain impurities, oxides or gases.

For the production of castings, the electric process offers large advantages because a high temperature is easily obtainable which reduces the scrap loss encountered with other systems. The furnace may also be used for the production of both iron and steel castings. A hot metal is also necessary to run thin sections when outlines must be sharply maintained.

### Manufacturing Axle Housings

When our company first started to produce axle housings for six-wheel trucks, several difficulties were encountered. In the first samples made, like those shown in Fig. 1, shrinkage cracks were found in the corners at *a*, *b*, and at *c*. These cracks developed because of the greater mass of metal at these points, which adversely affected uniform cooling. To overcome these, the next step was to leave off the corners and add extra metal to these corners, as shown in Fig. 2, which was afterward turned off.

To eliminate cracks still more effectively, metal chills, *d*, were added as shown, but at the present time these chills have been eliminated and instead a softer core is used, which is obtained by the use of a softer binder for the sand. The shrinkage cracks at *c* were most difficult to overcome and we had to eliminate the circumferential ribs and to cast longitudinal ribs, as shown at *e*, the small ring, *f*, being attached to the ribs instead of the outer housing. As a result, a sound casting is produced free from cracks. The ring is necessary to support the end of the chrome-nickel steel tube which supports the wheel bearings.

These castings contain about 0.30 to 0.31 per cent

carbon, with 1 per cent nickel added to the bath. As soon as they are poured, they are withdrawn from the mold (the core being removed), then permitted to cool slowly. Afterward they are annealed, the temperature being slowly raised (in 4 hr.) to 1625 deg. Fahr., where they are soaked for 2½ hr. They are then slowly cooled. The tensile strength of the metal is approximately 120,000 lb. per sq. in.

To produce these axle castings requires careful attention throughout the process. Special core mixtures, sand mixtures, and careful workmanship are necessary in preparing the mold. The specifications for these castings call for metal of the following limits:

	Per Cent
Carbon .....	0.28 to 0.31
Manganese .....	0.605 to 0.75
Silicon .....	0.20 to 0.30
Nickel .....	1.00
Sulphur .....	0.05 maximum
Phosphorus .....	0.05 maximum

The charge for the furnace is made up approximately of 70 per cent of purchased scrap of known analysis con-

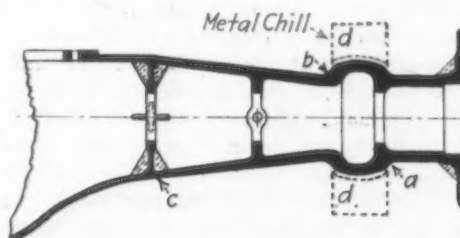


Fig. 1.—One of the First Axle Housings Made, with Location of Shrinkage Cracks Shown

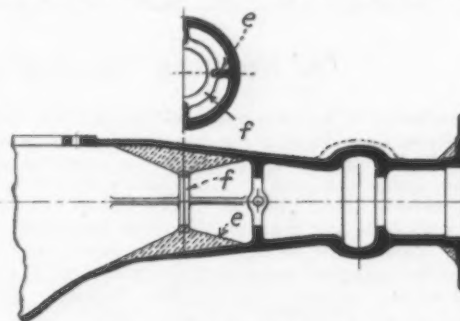


Fig. 2.—Where Extra Metal Was Added to Overcome Cracks and Defects

sisting of punchings, plate, butt ends, I-beams or solid tire rims. The remainder is the returns in the form of rejections, heads, gates and sculls or spills. About 100 lb. of metal from the previous heat is left in the furnace and the new charge put into it. This forms a solid, gummy mass and gives immediate electric contact and a hot arc. It eliminates the use of a starter such as coke. Some care is exercised in the charging to eliminate the necessity of much poking down as the melt progresses.

Preliminary melting is done on high tap. To melt down the charge usually takes about one hour. A sam-

\*Part of a paper presented at the Western Metal Congress of the American Society for Steel Treating, at Los Angeles, Jan. 14 to 18. The author is consulting engineer, Moreland Motor Truck Co., Los Angeles.

ple is taken and a color test run to determine the preliminary carbon content. The reading of a fracture in highly refined steel is rather uncertain and a small laboratory, equipped to test the carbon by the color method, is recommended.

Since the low-carbon steels are used as a base, the melt will usually run low in carbon and this, in one of its many forms, is added. The immersion of the graphite electrodes will usually accomplish the desired results. Cast iron and pig iron may also be added if desired. Should the test show a higher carbon content than specified, a high-grade, clean, hard hematite, low-phosphorus iron ore is added to bring it down. The ore is added in small quantities until the desired specification is finally reached.

The bath is then brought to the pouring temperature

and tests made of the metal and the slag to ascertain whether a thorough deoxidation has been accomplished. This can be ascertained from the slag—a light green color of the fracture showing complete deoxidation. As a further precaution there is added to the ladle a small amount of pure aluminum. The entire heat is tapped into a large ladle, the slag carefully skimmed off and a protective covering of clean silica sand put on. The metal is then transferred to pouring ladles of about 100 lb. capacity.

To obtain satisfactory results the material used, as mentioned before, must be very carefully selected. Limestone and fluorspar are always on hand to dissolve slag when necessary if alloys are to be added, adding silica sand afterward to bring the slag to its normal consistency.

## Zinc-Cadmium Solders Used for British Dirigible

CROSS bracing between main longitudinal and transverse frames in the British airship R-101 now under construction is made of high-strength steel cable, each strand of which is zinc coated. End connections are made with a special solder called "cazin," according to *Engineering*.

After the cable is clamped 2 in. from the end to prevent unraveling, it is cut to length. A fitting shaped with an internal cone (called a capel) is then slipped over the end, the wires splayed out, and the internal cone filled with the solder.

Cazin is a eutectic composition (82.6 per cent cadmium, 17.4 per cent zinc) which melts at 263 deg. C., low enough not to impair the strength of the cold drawn wire in the cable. It also unites with the galvanized coating of the wires without acid or chloride flux (only a little pure resin being needed) thus avoiding possibility of corrosion under traces of flux. The capel is Sherardized and slightly oxidized, so the solder does not adhere to it; the cone merely acts as a mold. Shearing strength of cazin is from 15,000 to 16,000 lb. per sq. in., and it does not extrude through the fitting when the cable is under load.

When the solder is cold the end surface is ground off square, and a clevis or forked end attached to each capel. Each assembly is given a proof load of 50 per cent of the

ultimate strength of the cable; this beds the cone end into the fitting and also stretches the cable sufficiently to prevent creep under the working loads.

Cazin was developed by the Research Association of British Motor and Allied Manufacturers in 1925, in response to a request for soldering material for bicycle frames, which would flow over cold drawn steel without tempering them and yet remain firm in an enamel baking oven. Shear strengths as high as 25,000 lb. per sq. in. may be had in other solders of this family.

## Increases Calorific Value of Coke Oven Gas

Increasing the calorific value of coke oven gas from about 4136 to 5368 thermal units can be accomplished by the following method, according to three German authors, R. Schoenfelder, W. Riese and W. Klempt: The gas is passed successively over catalytic material at 700 deg., the material being made up of nickel precipitated on magnesite to destroy organic sulphur compounds and to break down heavy hydrocarbons and, after the removal of hydrogen sulphide, over pieces of clay containing reduced nickel at 520 deg. to reduce carbon monoxide and carbon dioxide to methane and water by means of the hydrogen in the gas.

## Oil-Burning Steam-Operated Railroad Coach Perfected

THE Locomotor is a steam-operated railroad car developed by the Ryan Car Co. and the International Harvester Co., Chicago. The Locomotor requires only one operator and may be run from either platform. The controls consist merely of a throttle, reverse lever and air brake valve handle. The fuel used is an ordinary distillate, which is vaporized and delivered to a special type of burner in the heart of the steam generator. High-pressure steam is delivered to two eight-cylinder, single-acting, poppet-valve uniflow engines, simultane-

ously controlled, which are located underneath the frame of the car.

Each engine drives directly to the inner axle of the adjacent truck through propeller shafts that accommodate themselves to truck radial movement and spring action. From 300 to 500 hp. is delivered at the wheels, making the car capable of handling trailers and attaining speeds of 75 to 80 miles an hour. The Locomotor can be built to suit any standard car design.



# Leaves from the Diary of a Foundry Apprentice

BY H. A. FROMMELT\*

**Dec. 2.**—Only a month on the side floor, but the more jobs I get the more I realize how little I know. Each one is different and each one requires good judgment; and that comes with experience. Dry sand molding is interesting.

**Dec. 10.**—The foreman of the side floor gave me my first real lesson in gating today. Let's see; first, the gates must be large enough and the sprues numerous enough to allow the mold to fill up quickly. True enough, but only good judgment will determine that. Here again that means experience and lots of it. You can't develop judgment without a lot of experience. Well, I hope four years is enough.

**No. 2.** The metal upon entering the mold should not drop a considerable distance and thus wash out the bottom of the mold. That is easy enough; and I ought to be able to place a gate so that the metal does not have to do a Niagara to get into the mold.

**No. 3.** Avoid sharp corners; the metal should not run far after entering the mold; the gates and sprues should be so placed that they will not cause shrinkage cavities or strains in the mold.

And all of these demand experience and nothing but; how else can you tell when steel will or will not get tired before filling the mold or get disgusted in the gate and pull away, causing strains and shrinkage cavities? I understand, of course, that steel shrinks when it cools and naturally it sets up strains. But only experience can tell where and how to place gates to avoid all this. The books can't tell because every case is different. Experience, experience and then more experience; no wonder they have apprenticeships of four years.

**Dec. 20.**—Had my first real lesson in gates today from the standpoint of acting as reservoirs to feed the mold. It's not enough that these pesky gates have to be just right to usher the metal in, but they have to be a certain size and a certain number of them must stick their heads up above the top of the mold so that there will be enough metal to feed the mold. The foreman took me over to the shake-out floor and demonstrated what he meant by pointing out a sorry looking one that got too hungry and developed a huge aching cavity—at least I suppose it had an ache for those responsible. Gates, gates, if there was only some sort of table by which we could figure you out; but you are so contrary there is no telling what you will do under all circumstances. Experience is the only way to beat your game.

**Dec. 24.**—The party today was a grand success. A Santa Claus and all. Gee, the kids sure did enjoy it; some of the older kids, too. And to top it all off I received my first stock certificate today—a sort of Christmas present. I never would have it except for the deduction plan.

**Dec. 26.**—A few days off now, with a good chance to get those reports of the last few lectures out of the way and start the new year right. I still have one report to hand in regarding alloy steels and several on the company's product. Well, here goes; I might as well get them out of the way now.

**Jan. 2.**—There is nothing like writing these reports to clinch all these important facts about the metallurgy

of steel and also the constitution and uses of alloy steel. I know the effects of silicon and manganese; also the bad effects of sulphur and phosphorus and their limits that customers are demanding at the present time. I have Bullen's book on heat treatment but I am afraid it is a little beyond me. Perhaps I can get Mr. Haney to give me a lift over the hard spots. I wish there were a simpler book for such subjects.

**Jan. 10.**—Who would have thought that gaggers were important? Why it looked to me that their size was of little importance. I used some 4-in. ones for the job today and after the cope dropped out like so much loose sand I called for the Boss. I won't need to be told again that a short gagger is not only useless, but actually adds its weight to the sand without strengthening it.

**Jan. 15.**—The foreman brought a job to me this morning and asked which side I would place in the cope and which in the drag. Of course, I only guessed and like most guesses it was wrong. Then he explained to me that the side to be machined must always go in the drag; and the side with the ribs, which are only to add strength in this case, must go in the cope side. Of course, any dirt or slag being lighter than the iron will float and rise to the top. The machine shop has enough troubles without wasting time and money cutting our sand and slag. Another point driven home.

**Jan. 20.**—Add another lesson in finishing. This molder I am helping is a big leaguer. He showed me once and for all that a few minutes spent on ramming will save hours patching and finishing. He's a Yankee and an old-time molder. "The less pretty work you can brag about in the molding game the better real honest-to-goodness molder you are. Finishing is done in the ramming and that's mostly good sound head work. Don't get the idea that ramming is only a strong back job. It's one of the cleverest parts of the molding business. Once you decide how to mold the piece you've got, how to place the gates and heads and risers, then the rest of it is all in the ramming."

**Feb. 3.**—I've got my production up pretty well on the side-floor now and my scrap down. Up with production and down with scrap—that's my slogan.

**Feb. 10.**—This classroom end of the program is all to the good. Everything fits like a core in a mold. Every time I've made a change in departments my studies have changed accordingly. And that gets results for the company, too. We are not entirely green when we get to the job.

**Feb. 15.**—Saw a beautiful case of good risers on a flywheel today. The spokes looked perfect. And the inspector explained that it was largely due to the proper placing of those heads. Good head work, eh?

**Feb. 22.**—These lectures on modern machine shop practice certainly have given me a different idea of the game. I guess none of the trades has a monopoly on skill, science, head work, etc. Still I wouldn't trade with any of them. I can't see this business of standing all day at one machine. But every man to his own tastes, I suppose.

From the organization standpoint I can see the necessity for close coordination and cooperation. After all we are part of an establishment in which foundry, machine shop, pattern shop, etc., are all essential.

**Feb. 25.**—Mr. Haney took six of us today on a sort of inspection trip, in which we followed an order from the time it arrives in the customer's letter to the shipping of the product and the sending of the invoice. Then to the advertising department, where the "sappers" prepare the ground for business; then into one of the main offices to closely inspect a map showing the location of all the branch offices necessary to keep business stirred up. That certainly was an eyeful. It takes brains to run a business like this, and our officials have got to be on the job or we could pack up our tools and take a long vacation. Mr. Haney promised more of these "revelations."

\*Dean, mechanical engineering, Marquette University, Milwaukee.

# Preventing Shattered Shaft Linings

Laboratory Studies to Determine Cause of Disintegration  
of Shaft Brick—Plant Control and Tests on Brick  
Before Shipment



Central Research Laboratory of General Refractories Co.

**D**ISINTEGRATION of blast furnace linings is a phenomenon which has been reported at various times. In the past such occurrences have been considered inevitable. However, during the war years and immediately afterward, attention was focused on this phenomenon and re-

sulted in much discussion between blast furnace operators and manufacturers of refractories.

Briefly, the situation was about like this: A furnace would be relined in the approved manner with brick, having all the appearance of soundness, apparently first class in shape, uniformity and burn. The lining would then be carefully dried and the furnace gradually blown in. Sometimes after a relatively short campaign, of normal regularity, the furnace would develop serious hot spots. After blowing out, a considerable portion of the inwall might be found to be badly shattered at these hot spots and sooty carbon deposited inside the brick structure.

Various ingenious hypotheses were advanced to account for this phenomenon, since definite knowledge was lacking about whether the damage was done during drying out, normal operation, or cooling, whether disintegration was due to the furnace charge or gases, or to some defect in the brick itself. Thus the trouble was variously ascribed to moisture in the brick, iron in the brick, alkali chlorides, zinc or lead from the burden, abnormally high co-efficient of expansion of the brick, improper selection

and treatment of clay or burning of brick themselves.

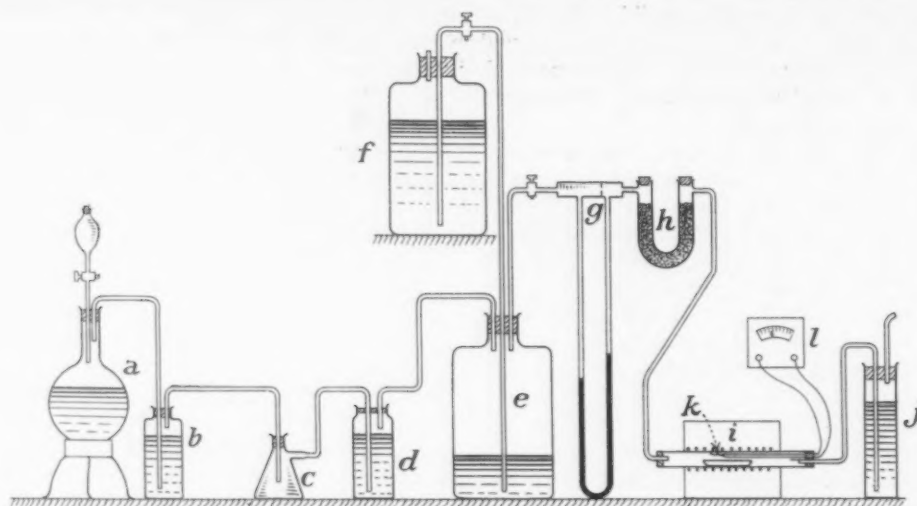
C. E. Nesbitt and M. L. Bell, as research engineers for the Carnegie Steel Co., investigated the problem and reported their findings to the American Iron and Steel Institute in May, 1923. Field studies on linings which had not been abused either during construction or operation indicated that disintegration was caused by carbon deposition at spots in the brick and that it occurred where the temperature of the lining was relatively low. One of the laboratory tests showed that ferric oxide, exposed for 10 hr. in a stream of carbon monoxide at a temperature fluctuating between 420 and 470 deg. C., accumulated 70 times its volume of carbon. Test bricks, made from first grade clays substantially free from iron, when heated under such conditions retained their soundness, but disintegrated rapidly when 1.5 per cent of hematite ore fines had been added to the raw mix. The conclusion was that brick for blast furnace linings should be made of fire clays analyzing very low in iron.

From a refractory manufacturer's standpoint this conclusion was difficult to face. As a practical matter it would often be quite impossible to keep the iron content at a fraction of one per cent without admixture of clays unobtainable locally, or procured at unwarrantable expense. It was suspected, also, that the mineralogical characteristics of the contained iron had much to do with carbon deposition and brick disintegration; thus free iron oxide or iron sulphide might cause trouble, whereas iron silicates might be innocuous.

This practical problem was one of the first to receive attention from the research department of General Refractories Co. in the central research laboratory, newly built at the Baltimore plant. The attack on this problem resolved itself into four divisions:

- (1) Identification of the various iron minerals existing in commercial blast furnace lining brick.

Fig. 3. Sketch of Train of Equipment Used to Study the Effect of Hot Atmospheres Containing Carbon Monoxide Upon Minerals Found in Bricks for Lining Iron Blast Furnaces



(2) Determination of which of these react with CO at certain temperatures existing in the shaft.

(3) Working out a plant process which prevents such minerals from existing in the burned brick.

(4) Instituting routine tests to insure that the specially processed brick will not disintegrate even under the worst combination of conditions.

Considerable work in the petrographic laboratory (a view of which is here given) and an examination of



Fig. 2. Petrographic Laboratory, Where Thin Sections of Raw Materials and Finished Products Are Made and Examined in Polarized Light Under the Microscope

published literature indicated that a finished brick may contain the following iron minerals, depending upon the nature of the original clays and the burning conditions, namely, ferric oxide; magnetite; fayalite and a eutectic of iron, alumina and silica.

The laboratory apparatus shown was then constructed to observe what happens when each of these minerals is exposed to gas atmospheres containing carbon monoxide.

The apparatus consisted essentially of a small tube furnace for heating the various iron compounds in a CO atmosphere and means for generating the CO. A train was set up to purify and dry the CO gas before it entered the furnace. The gas flow was controlled by a flowmeter. The temperature of the furnace was measured by means of a rare metal thermocouple and pyrometer.

The various parts of the gas train are indicated in the cut of the apparatus:

- a. CO generator using formic and sulfuric acids.
- b. Soda lime scrubber to remove CO<sub>2</sub>.
- c. Trap.
- d. Pyrogallate solution scrubber to remove O<sub>2</sub>.
- e. Gas storage bottle.
- f. Pressure bottle.
- g. Gas flowmeter.
- h. CaCl<sub>2</sub> drier to remove water from CO.
- i. Silica tube electric furnace to heat specimens.
- j. Milligan gas scrubber used as flow indicator.
- k. Thermocouple junction within furnace.
- l. Pyrometer attached to thermocouple.

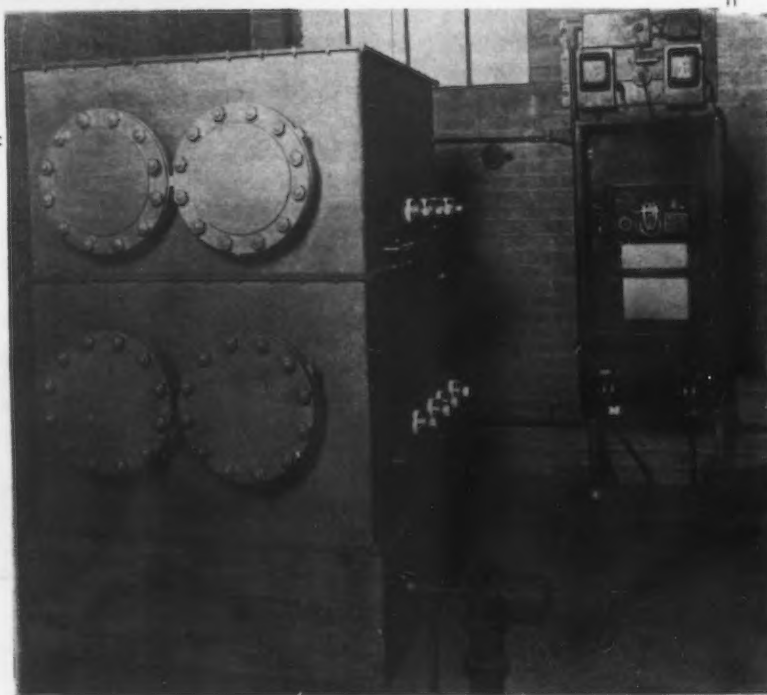
It was found that time of exposure to carbon monoxide and the temperature employed played an important part. Under conditions of the experiment a temperature of 450 deg. C. and 8 hr. exposure gave positive reaction. To accelerate the tests, concentrations of 95 per cent or more CO were used, although blast furnace gas contains approximately 25 per cent CO.

The experiments pointed out that of the above enumerated iron compounds only two, iron silicate and the iron-alumina-silica eutectic, would not decompose carbon monoxide and were therefore harmless. Any of the three oxides of iron as well as sponge iron would cause carbon to deposit on them.

Having thus determined that free oxides were the culprits and that the silicates were harmless, the next step was to work out such plant processes as would insure that any iron compounds contained in the raw mix would be converted during burning to a harmless mineral.

To make sure that the laboratory investigation and plant control have effected the desired end, bricks are taken from specified positions from each kiln load and sent to the Baltimore laboratory. Here they are broken

Fig. 4. Four-Chambered Furnace, Electrically Heated and Automatically Controlled, for Testing Sample Bricks in Hot Carbon Monoxide Atmospheres, to Insure Soundness of Blast Furnace Linings



in half and one portion subjected to an atmosphere of pure CO at 425 to 485 deg. C. for 200 hr. No brick is shipped from that particular kiln until the laboratory certifies that all samples remained sound throughout this test. Since it is known that these very severe test conditions cause far more voluminous carbon deposition than those encountered in the blast furnace lining, the customer may be confident that any such approved refractories will be immune from disintegration in service.

A four-muffle electric furnace, automatically controlled, has been installed to handle the large number of lining brick received for routine testing. An accom-

panying illustration indicates its construction. The furnace consists essentially of an insulated chamber in which are located four horizontal cylindrical iron bombs capable of holding 10 samples each. These bombs are heated electrically by means of Chromel resistance units. Tem-

perature control and recording is by standard Leeds and Northrup potentiometer. The CO gas is generated by passing carbon dioxide (from compressed gas cylinder) over heated charcoal, and a small pump is provided to circulate the gases.

## Metals Used in Latest British Aero Engine

DETAILS of the new water cooled Rolls-Royce aero engines, known as the "F" series, are given in *Engineering* for Dec. 28, 1928. These 12-cylinder engines develop 480 hp., and weigh 865 lb. dry, but completely equipped. The object of the new design was to give a reduced frontal area and low fuel consumption; at 7 to 1 compression the latter amounts to 28¼ gal. per hr.

Two sets of six cylinders are cast monobloc of aluminum. Liners are of carbon steel; space is left between aluminum cylinder and steel liner for water circulation. Renewable valve-seating rings are screwed into the heads; valve spindles are guided by cast iron sleeves. Valves are machined from drop forgings of high silicon-chromium steel. Camshafts are of 5 per cent nickel steel, machined from the solid, case hardened, and ground; rocker arms are drop forgings similarly finished and heat treated.

Aluminum pistons are Y-alloy forgings, machined all over. Hollow gudgeon pins are 5 per cent nickel steel, case-hardened and ground. Connecting rods are of H section, forged from 3½ per cent nickel steel, machined all over, and heat treated. Connecting rods are in pairs; one is forked to straddle the other, and ends in a split

steel block, lined both externally and internally with white metal. The upper ends of connecting rods are fitted with floating bushings of phosphor-bronze.

The crankshaft is machined and ground to close limits from a nickel-chromium steel forging, and hollow bored. The seven main crankshaft bearings are split mild steel shells lined with white metal and fitted into recesses in the crankcase casting.

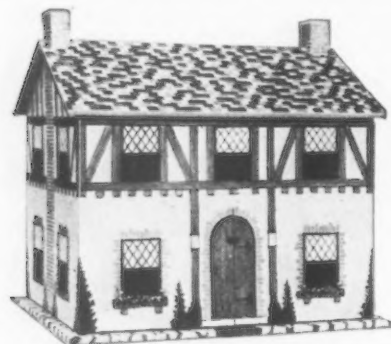
Gearing between crankshaft and propeller shaft is of air-hardened steel; teeth are ground after heat treatment. This gearing is inclosed in a cast aluminum casing.

Before acceptance all steels are subject to Brinell hardness and Izod impact tests. Each crankshaft and propeller shaft is tested separately for physical properties. Other forgings are selected at random after heat treatment in certain proportion, and given tensile, impact, and fatigue tests. Tensile test pieces are cut from each aluminum cylinder block and crankcase, and test pieces are cast from each heat of non-ferrous metals.

Our British contemporary concludes: "Some of these engines, it is interesting to note, are required to replace those of American manufacture, imported some time previously."

## Doll Houses Made of Sheet Steel

A RECENTLY developed and novel use for steel sheets is found in the Cozytown all steel doll houses now being manufactured by the Frier Steel Co., Inc., 3306 Washington Boulevard, St. Louis. Heretofore toys of this kind have been made principally from cardboard or wood and the use of steel is said to offer many advantages not found in the older types. The steel houses may be shipped flat and assembled either by the retailer or the customer. Depreciation is greatly reduced since the houses may be



This Doll House  
Was Made of 22-  
Gage Sheet Steel,  
Specially Treated

washed and do not become shopworn easily. They are also practically indestructible in the hands of a child, and may be used either inside or out-of-doors as they are not affected by rain and moisture.

The houses are manufactured from 22-page sheet steel, specially treated. The sheets are blanked and then coated twice on each side, a 20-min. bake following each coating. The exterior designs are then laid on by the oil screen

process, baking following the application of each color. The inside of the house is decorated by means of a rotary printing press equipped with rubber dies. It is interesting to note that the manufacturer found it necessary to manufacture its own printing press for this purpose. Following the application of the design color, each piece is varnished and then formed, cleaned by hand and packed. Stove bolts are used throughout for assembling and the houses are supported on rubber legs to prevent scratching.

Last year the houses were offered for sale at retail prices ranging from \$9 to \$18.50, but this year, due to economies in process, the company is offering a line of steel doll houses either assembled or disassembled at popular prices.

A locomotive operating at 850 lb. steam pressure has been in operation on the Swiss Federal Railways since June, 1928, according to *Engineer*, and on 200-mile daily runs shows a coal saving of 25 to 38 per cent and water saving of 36 to 51 per cent from a modern locomotive of equal horsepower but operating at 170 lb. steam pressure. The boiler has three seamless drums 14 ft. 9 in. long, the top one 2 ft. 2 in. internal diameter and the two bottom ones 8 in. Fire box side walls consist of closely spaced vertical tubes connecting these drums; front and back water walls of the fire box are of flange steel welded at all joints, stayed with tubes and flues welded in. A three-cylinder uniflow engine (8½ in. diameter by 13¾ in. stroke) drives through a jack-shaft (gear ratio 1 to 2.5) connected to the three pairs of drivers with side rods.

# Steel Production Adjusted to Demand

Position Regarded as Sound, Though Much Depends on  
Automotive Situation—Too Much Pig Iron  
Being Made

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

**T**HOUGH conditions seem to be rather mixed, both territorially and among the various steel products, the statistical indications are that the total supply of steel continues in good adjustment with demand.

## *Decline in Steel Demand*

**A**S anticipated, another decline occurred in our composite demand line during December, in which month it fell to the lowest point since last July. Activity in railroad transportation, building, manufacturing and machine tools, mining, and in exports was lower than in November. The only important increase occurred in automobile production. Presumably this meant a decrease in the potential December requirements of the chief steel-consuming industries. This presumption is confirmed by the fact that the sales of most of the chief finished steel products declined in December, which is the first decline that has occurred in that month since 1925.

The decline in the composite demand line, however, carried it but little below the level of ingot production in December. In fact, it cannot be said that steel production is out of line with indicated requirements. The demand line at the end of the year pointed downward, while steel production was on the increase, and this might suggest unfavorable possibilities. But subsequent developments are reassuring.

Steel production in January increased less than usual, indicating a declining trend. At the same time, preliminary estimates indicate that the composite demand line will show an upturn in January, for railroad freight traffic, construction activity, and, above all, automobile production, all turned upward in that month. This, coupled with the declining trend in steel production, indicates a sound position and a favorable outlook for the near future.

## *Conditions in Specific Industries*

Endeavoring to look a little further ahead, we must conclude that the prospects largely hinge upon the suc-

cess that the *automobile* producers may attain in their spring drive for business. January estimates indicate a sharp increase in motor production. The manufacturers are offering large values and putting forth great sales efforts. The fact remains, however, that there is now no shortage of automobiles, and it is noteworthy that the leading producer has found it desirable to advertise used cars. Most observers agree that there is a distinct possibility of over-production and that the severest sort of competition is probable. A heavy demand for steel for automobiles is certain during the near future, but beyond that one must place a question mark.

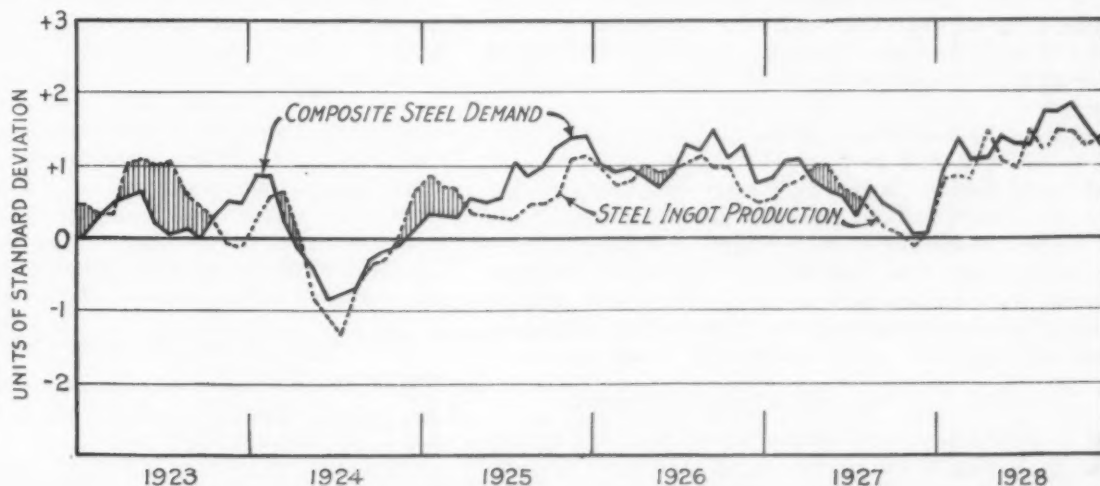
The railroad outlook seems fair. Both traffic and earnings are above a year ago, but we have to remember that a year ago the carriers were doing rather poorly. The present state of the equipment demand is discussed below.

Under the influence of tight money and a weak bond market, the major trend of *building activity* continues to be downward. Recently there has been a move to stimulate building financing by putting out stocks secured by real estate. The success of this move is doubtful and is certainly limited by the severe blow to speculative sentiment last week. January structural steel orders, however, were well sustained by miscellaneous heavy work, averaging about 38,000 tons a week, which is above December. The decrease in construction contracts was also less than usual and contemplated new construction, though much lower than a year ago, showed considerable recovery. It is evident that the bottom is not going to drop out of construction operations, to say the least.

*General manufacturing* (excluding automobiles and steel) bids fair to continue in good volume, but without much further increase. Machine tool orders appear to be on the decline, allowing for seasonal conditions, but the volume continues large in automobile accessories, electrical equipment and machinery in general.

Cold weather has brought some recovery in coal min-

Steel Ingot Production (Adjusted) Showed a Rise in December and a Further One in January. Composite demand in December indicated a continuance of the falling off of November



ing, and copper mining continues to increase. Both drilling operations and crude oil production continue to grow larger. The heavy over-production of petroleum will doubtless mean an increased demand for steel temporarily.

The agricultural situation is fair, but not much more than that can be said. The latest data indicate a decline in the farmers' gross income from crops and animals during the late months of 1928, and farm prices averaged a little lower in January than in December.

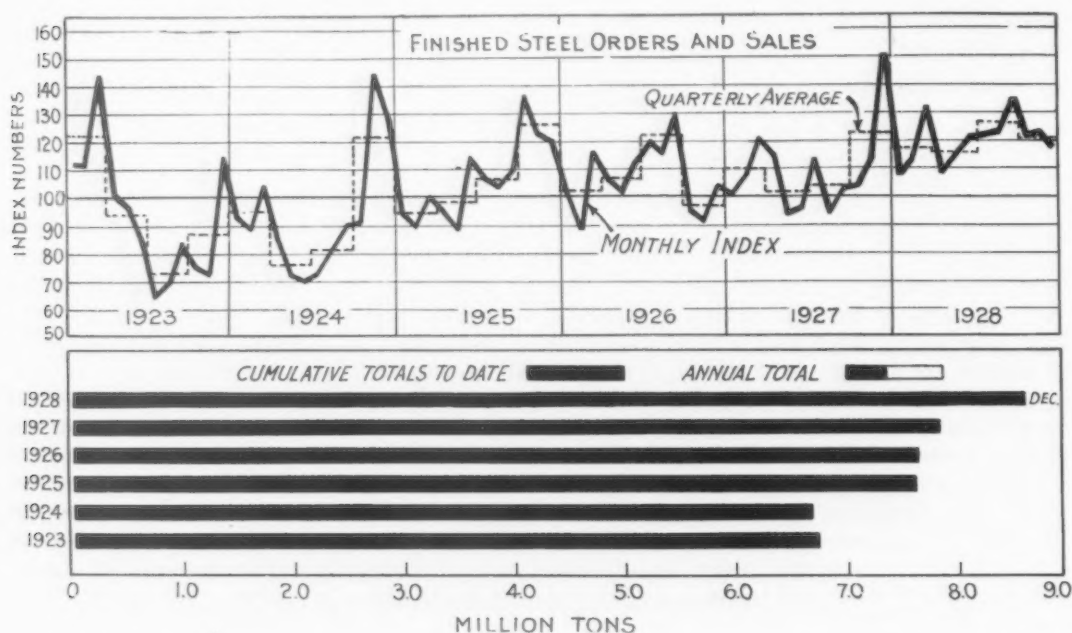
Exports of iron and steel declined quite sharply in December. It remains a question whether, in view of the decline in foreign loans, exports can be sustained in the future at as high a level as they reached last year.

On the whole, we may conclude that automobile production will keep the total demand for steel up to a high level for another month or two, helped by the recent increase in railroad equipment buying, but that later on the

12,452 freight cars were ordered in January, which is the largest volume for any month since December, 1927. This figure is not extraordinary, but it is above the average of any two months in 1928. The total for the three months beginning with November is over 33,000 cars.

This doubtless reflects improved earnings of the carriers, but it also represents a seasonal peak from which a seasonal decline is likely to begin soon. The surplus of freight cars in good order is still large. It is fair to say that the buying of freight cars shows a material increase and is encouraging, but it does not seem wise to count on the movement being long sustained.

As to locomotives, the orders declined in January, as usual. Domestic orders for steam locomotives amounted to only 28. This compares with only 2 ordered in January, 1928, but the comparison does not give much ground for enthusiasm. Total orders for steam and electric loco-



Buying of Finished Steel Made a New High Record Last Year. The cumulative total for 11 months was greater than in any previous 12 months

outlook is quite uncertain, with the chances favoring a gradual decline in demand.

### Lower Sales of Finished Steel

**S**ALES of important items of finished steel decreased in December, which is unusual for that month. The volume was much below that of a year ago. Total sales during the fourth quarter fell below those of the third quarter, and the only other recent year of which this is true is 1926. (January sales nearly always fall below December, but this year the automobile expansion may have brought such a demand for sheets as to offset the usual trend.) The total sales of finished steel in 1928 far exceed those of any other year since war times. As the chart shows, there was a remarkably sustained volume of sales at a high level, but rounding off toward the end of the year.

Sheet sales fell off in December, which is contrary to the usual trend, and were below the same month of several recent years. Sales of fabricated structural steel increased slightly, but the gain was much less than usual for the season and the December figure was lower than in any recent year. Steel castings, however, show the usual seasonal increase and were larger for the month than in either of the two preceding years. The sales of plates declined and were only about the same as a year ago.

### Freight Car and Locomotive Demand

**R**AILROAD equipment demand shows divergent trends, the buying of freight cars being good, while locomotive orders have declined. According to *Railway Age*,

including foreign business, make a less favorable showing. Though January shipments numbered only 23, which is the lowest in years, the unfilled orders declined. It may be said, however, that a decline in orders is usual in January.

### Steel Production Well Above Normal

Average daily production of steel in January was only 12.2 per cent above our estimate of normal. (It should be remembered in making comparisons that January this year had one more business day than January, 1928.) Production increased and was 16 per cent above the line of long-time trend, but the increase was much less than usual for the season; our adjusted index is thus only 112.2 against 116.6 in December. This represents the lowest annual rate of steel production since last July.

The curve of average daily steel production, adjusted to eliminate the merely seasonal changes, still appears to be rounding off. This is encouraging from the point of view of those who may have feared over-production, but it furnishes ground for thought to those who accept the reported figures as indicating new high records.

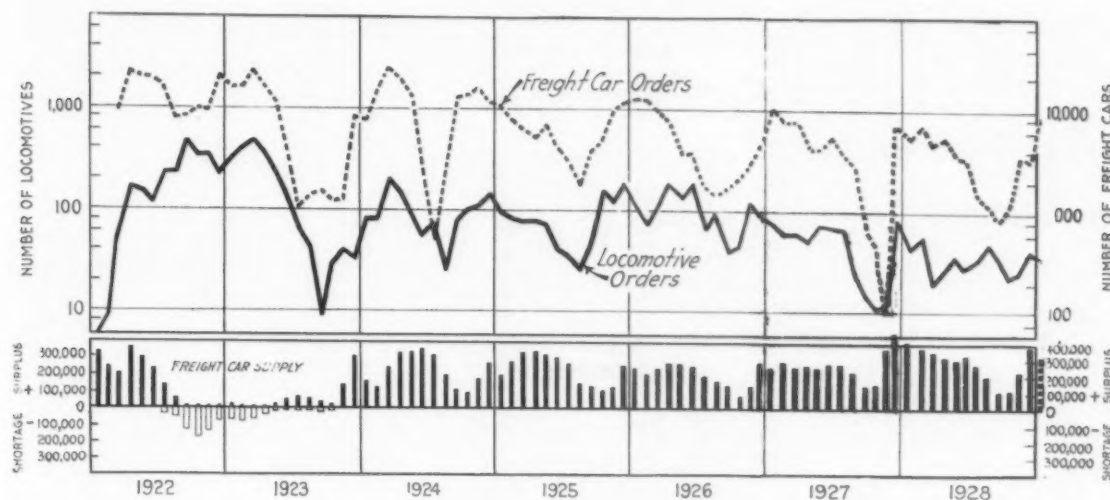
The unfilled orders of the Steel Corporation in January increased more than usual for the season.

### Output of Pig Iron Too Great

**P**IG iron production in January continued its upward trend, while pig iron prices held a little on the weak side. The average daily production of pig iron, at approximately 111,000 tons, is 15.3 per cent above the line of long-time trend, which is two points higher than in De-

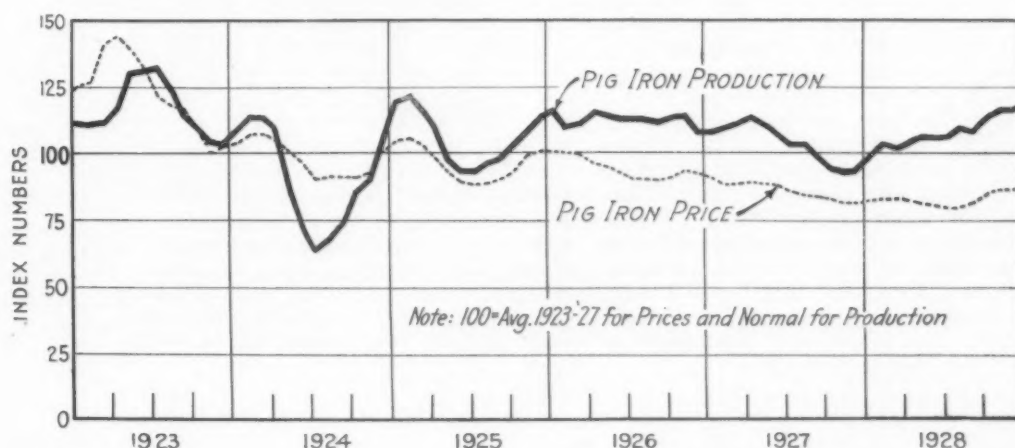
cember. Moreover, there is usually a seasonal decrease in January, which fact further magnifies the significance of the increase last month. Our final adjusted index of pig iron production, which allows both for the normal growth of the country's requirements and for the merely seasonal

present conditions make it extremely difficult to make any definite forecast. The speculative situation in scrap, like that in copper or in the stock market, defies the statistician. Moreover, the duration of the automobile demand introduces a major uncertainty. It seems safe to say



Railroad Car Orders Are Improving, While Locomotive Orders Continue Low. But the surplus of cars is so large that there is no indication of immediate need for heavy purchases

Pig Iron Production (Adjusted) Continues to Advance. Prices have shown a weaker tendency, but remain higher than a year ago



changes, indicates that production is now nearly 19 per cent above theoretical normal.

Pig iron production, thus figured, is at the highest annual rate that has existed since February, 1925. It is very far above normal. It is high in comparison with steel production. While it is true that high scrap prices are tending to encourage the consumption of pig iron, we may conclude that it is only a question of time before this abnormal output will bring an excess supply and lower prices. (THE IRON AGE composite index of pig iron averaged lower in January than in December.)

#### Scrap Prices Out of Line

Judged by the standards of recent years, pig iron is still cheap, while steel scrap is very dear. The spread between scrap prices and finished steel prices is the smallest since 1922, while scrap is the highest in comparison with pig iron that it has been in many years. We can, therefore, say that it is also only a question of time until scrap prices decline.

Of course, time is very important. Unfortunately,

that scrap prices are too high and that, whenever the readjustment develops in the scrap market, it will become very apparent that over-production of pig iron exists.

#### Eight Tons of Material Involved in One Ton of British Pipe

One ton of cast iron pipe means wages paid in England on "getting" and converting eight tons of material, says a writer in the *London Iron and Coal Trades Review*. He points out that it takes three and one-half tons of iron ore, one-half ton of limestone and two tons of fuel, or altogether six tons of British materials, to produce one ton of pig iron, and over one ton of pig iron to make one ton of cast iron pipe. Therefore, a total of eight tons is conveyed on British railroads. Every ton of pipe ordered from a British firm means wages paid on transporting and converting eight tons of British raw materials and every £100 spent on pipes made in England means over £75 paid for British workmen, most of which comes directly from the makers.

*Schedule of the next instalments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows: Feb. 28—Activity in Steel Consuming Industries; Mar. 21—Position of Iron and Steel Producers.*

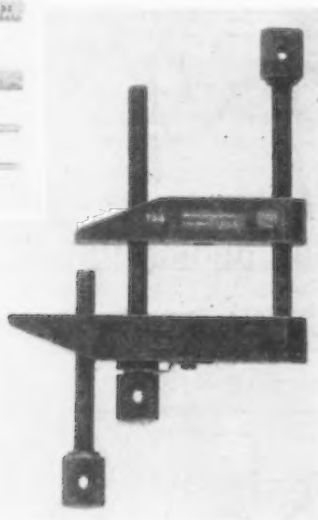
## Toolmaker's Clamp with Long Jaw

**S**MALL tools recently added to the line of the Brown & Sharpe Mfg. Co., Providence, include a new tool-

a convenient feature when, because of the size of the holes, the rules cannot be used. The rod and rule are



The Clamp with Extended Jaw Is Shown Below and the Rule Depth Gage with Rod Is at the Left



maker's clamp with a long jaw and auxiliary screw, and a rule depth gage with a 5/64-in. rod for measuring in small holes.

The long jaw of the new clamp, which is designated as the No. 756, permits holding pieces that the usual clamp will not grip. The auxiliary screw provides rigid support and prevents slipping, while the spring attachment on the adjusting screw holds the loose jaw in position at all times. The jaws are rounded on the ends to permit clamping under a shoulder. By changing the position of the screws in the jaws, the tool can be used as a regular clamp, with the added advantage of an auxiliary screw. Two sizes, with 2 and 2½-in. jaw opening, respectively, are made.

The rod of the new depth gage is

locked conveniently by turning the knurled nut on the base. The latter is 2½ in. wide. This tool is furnished with a 4-in. rule and with or without a 4-in. rod; or with a 6-in. rule and with or without a 6-in. rod. The graduations on the scales are either in English or metric measure.

Oct. 16, 1928; the Canadian patent, Aug. 12, 1927. Mr. Williams is assistant general master mechanic at the Brier Hill division of the Youngstown Sheet & Tube Co.

## New Electric Strip Heater

**A** NEW electric strip heater has been announced by the General Electric Co. It is designed for use in crane cabs, valve houses, pump houses, process machines, drying ovens, water baths and the like.

The device is 24 in. long, 1½ in. wide and ¾ in. thick. Slots are provided in each end allowing the heater to be supported in air or clamped to a metal surface.

The current-carrying resistance wire inside the sheath is the usual nickel-chromium resistor wound in a helix. The coil is supported at each end by a porcelain insulator and is stretched down the length of the unit four times.

## Sterling Grinding Wheel Organization Meets

The Sterling Grinding Wheel Co. held a meeting of its sales staff with the manufacturing organization at Tiffin, Ohio, Jan. 30. The plant facilities were inspected by the visiting salesmen and representatives of Sterling agencies.

In the evening both sales and manufacturing organizations attended a banquet, which was followed by round table discussions. President H. W. Caldwell presided.

## Sheet Piler Avoids Scratching Sheets

**A** SHEET or plate piler that eliminates the work ordinarily done by two men on steel mill cold rolls, oilers, pickler dryers, continuous open annealing furnace roller leveler and finishing levelers has been patented by John D. Williams, Niles, Ohio.

Four of these pilers, made by the McKay Machine Co., Youngstown, are in use in the Mahoning Valley. Three have been put to service at the Youngstown plant of the Sharon Steel Hoop Co., and a fourth at the Newton Steel Co., Newton Falls, Ohio. The cost of each machine is estimated at between \$3,000 and \$4,000.

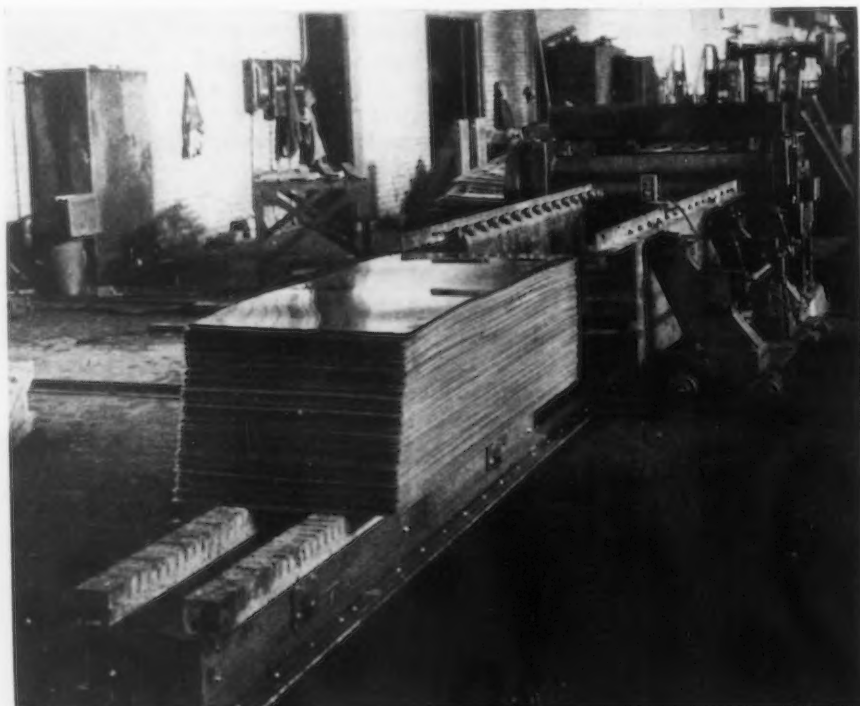
Reduction in both scrap loss and labor cost is made possible by the invention, it is said. Uneven annealing and scratching of sheets are eliminated. The sheets go on to the piler from other carriers and are conveyed along two parallel bars equipped with rolls made of micanite. An adjustable contact plate closes the circuit when touched by the sheet, and the bars are caused to be withdrawn sideways, leaving the sheet to fall flat on to the pile.

A lowering device has been perfected, also, to be used when high-finish sheets are being handled. It

lowers automatically as the stack grows, each sheet falling only 4 in.

United States patent was granted

Seven prizes, totaling \$500, will be awarded by the National Electrical Manufacturers Association and the National Electric Light Association for the best slogans to promote the use of electric heat in industry.



## Reamers for Automotive and Other Work

**R**ECENT additions to the small tools made by the Brown-McLaren Mfg. Co., 5853 West Fort Street, Detroit, include a line reamer for automobile rear axle housings, a short set adjustable reamer and a new Connell adjustable shell reamer for heavy-duty work.

Simple and rigid construction feature the line reamer for rear axle housings, which is a left-hand spiral tool that makes four cuts, two reaming and two facing, simultaneously. The diameters of the reamed holes are held to an accuracy of 0.0005 in. because of the fit required by the rear axle roller bearings; on the facing cuts the accuracy is within 0.001 in. In one application, the post of the tool is held in the horizontal spindle of a special machine, while the other end of the tool is supported in a fixture on the sliding carriage of the machine. The work is mounted on a fixture and is positioned by sliding it over the reamer.

Another multiple line reamer brought out by the company is for reaming crankcase main bearings. The individual tools are slid on to the slotted bar as shown in the illustration, and are locked by giving the tool a slight turn. Reamers of various sizes can be used and, because of the simple locking arrangement, tools may be changed easily.

Short set adjustable chucking reamers, heretofore made only to order by the company, can now be obtained regularly in five sizes, from  $\frac{3}{4}$  to 1 in. Blade adjustment from 0.035 to 0.085 in. is provided, which adapts the tool for use in the holes of wrist pins and of similar pieces. The body is made from one piece of chrome vanadium steel, heat treated, and is centered on both ends for regrinding. The high-speed steel blades have left-hand angle and are set staggered to prevent chattering.

The shank diameter and length of the  $\frac{3}{4}$ -in. and the 1-in. short set reamers are: 15/32 in. and 6 11/16 in., and 11/16 in. and 10 1/4 in., respectively. Three sets of blades cover the entire range of sizes.

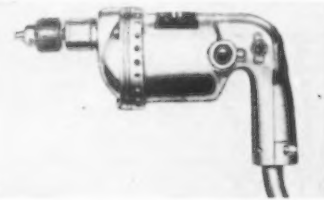
The new Connell adjustable reamer for high-duty requirements features rigid construction and increased oil and chip space. The latter feature adapts the tool for reaming deep holes and permits considerable more work before removing the tool for cleaning out the hole. The tools fit standard arbors and the range of sizes is the same as the company's standard shell reamers, namely 1 1/4 to 7 in.

The body and locking collars, which may be either single or double locking, are of alloy steel, heat treated. The high-speed steel blades are ground all over to assure good fit both on the

sides and bottom of the slots. They have forward adjustment and can be set for bottoming holes. The blade screw holds the cutters firmly in the slot and cannot work loose, although the blades may be removed easily when necessary. Longer life of blades, because of greater adjustment, is claimed. Five sets of blades serve for all sizes of the tool.

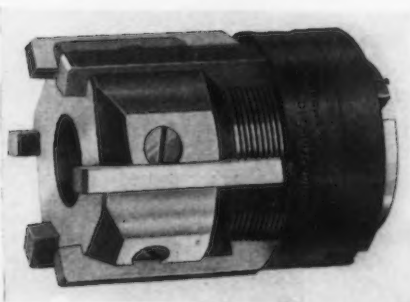
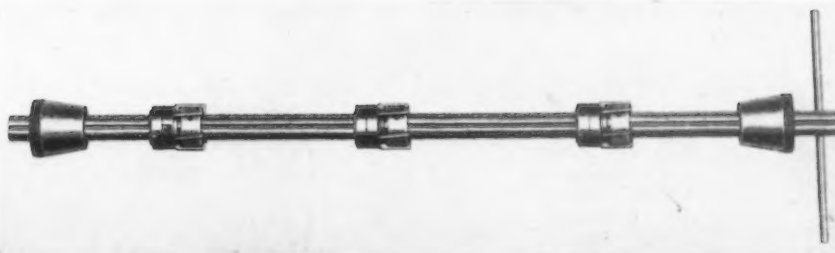
## One-Fourth-Inch Light-Duty Electric Drill

**D**ESIGNED for use by automotive shops and electricians, and other mechanics, a new  $\frac{1}{4}$ -in. light-duty electric drill of the Van Dorn Electric Tool Co., Cleveland, is here shown. It is not intended for con-



tinuous production drilling, but for intermittent work.

Being light and compact, it may be carried in the tool kit. The handle design and reduced length adapt it to use in close corners. It has universal motor and hardened alloy steel gears.



The Upper Tool Is for Reaming Axle Housings and the One Below Is for Crankcase Main Bearings. The new adjustable shell reamer, at the left, features rigid construction and increased oil and chip space. The short set adjustable reamer shown below is now regularly made in five sizes



## Safety Records in New York Metal Plants

Frank J. Quigan, Inc., 65 Roebling Street, Brooklyn, maker of metal novelties, was the winner of an accident prevention contest among metal manufacturers which was carried on during 1928 by the Merchants' Association of New York. The employees of this firm worked a total of 643,466 hours with no lost time accidents. The Metropolitan Iron Foundry, 880 Metropolitan Avenue, Brooklyn, was second, with 205,849 hours without lost time accidents, and Dieges & Clust, 568 Broadway, New York, third, with 196,169 hours.

Not a single life was lost among the 9275 employees of the 93 metal manufacturing companies participating in the contest and 36 plants went through the year without a lost time accident. There were but 269 lost time accidents recorded in all the plants participating.

The experience of the Quigan company is of particular interest because of the demonstration it has provided of financial savings brought about by organized safety effort. In 1923 the company paid \$3.08 per \$100 of payroll for compensation insurance. This figure increased to \$3.25 in 1924, but with the introduction of organized safety efforts in 1926, it dropped to \$1.66 per \$100 of payroll in 1927 and to \$1.21 in 1928. This has amounted to a saving of approximately \$7,000 a year.

## New Line of Milling Machines

**P**LAIN and universal milling machines in sizes from No. 1 to No. 4 have been placed on the market by the Shields Machine Tool Co., 407 West Street, New York. The table of the smallest machine has a working surface of 11 by 40 in. and movement of 22 in. longitudinally, 8 in. transversely and 18 in. vertically. The table of the No. 4 machine is 15 x 68 in. and has movement of 42 in. longitudinally, 14 in. transversely and 19 in. vertically. The net weight of the smallest machine is 3100 lb. and of the largest 6800 lb.

The base, column, knee, saddle and table are chrome-nickel semi-steel castings. The column is of box section, is ribbed and has internal reinforcing walls. The spindle is carried at the front end in a large phosphor-bronze bearing and at the rear end in a ball bearing. All other shafts are mounted in ball bearings and all bearing seats are integral with the column and knee castings. Columns and knee ways are rectangular. Shafts are of alloy steel, and all gears are heat-treated, and are chamfered where necessary. The overarm is of patented square design and supports the arbor rigidly.

Standardized spindle nose, power feeds in all directions, spindle reverse and automatic cutter coolant system with patented saddle pan and extension shield, are regular features. The saddle pan and shield serve to catch chips and coolant, the latter being drained back to the reservoir, thus keeping all slides, guides and the floor free from chips. The coolant pump and reservoir are inside of the column, and all piping is eliminated by means of an inside coolant return.

The feed mechanism is entirely inclosed in the knee and complete control is from the front of the knee. Universal shafts are eliminated by the use of a long-gear. Eight feeds forward and reverse are obtainable in geometrical progression, and feeds in any multiple of the standard range can be provided. The feed drive is direct from the main drive shaft and is independent of the spindle speed. The feed screws run in ball bearings and are equipped with 4-in. diameter dials to facilitate accurate reading. For each desired change of feed or speed only one train of gears is in mesh at one time. Each feed lever engages or disengages the desired feed, no auxiliary levers being employed.

Spindle speed changes are made by an automobile type of gear shift, eight speeds forward and reverse, in geometrical progression, being ob-

tainable. A flywheel on the drive pulley provides smoother power transmission, and the main drive shaft is full floating. Starting levers are provided on both sides of the machine.

Lubrication is automatic. All mechanism inclosed in the column, knee and saddle is flooded with oil. The accessibility of the various units of the machine is a feature emphasized. The friction feed drive, clutch and spindle may be adjusted from the outside. The speed shifting mechanisms are a unit with the cover plate, which when removed exposes the clutch and entire spindle gear train. The knee unit may be removed from the column conveniently, giving access to the feed drive, and by lifting the saddle from the knee, the feed and rapid transverse is made accessible. Safety devices, protecting both the machine and the operator, and convenience of control, are other features. Directional control eliminates mistakes in shifting control levers.



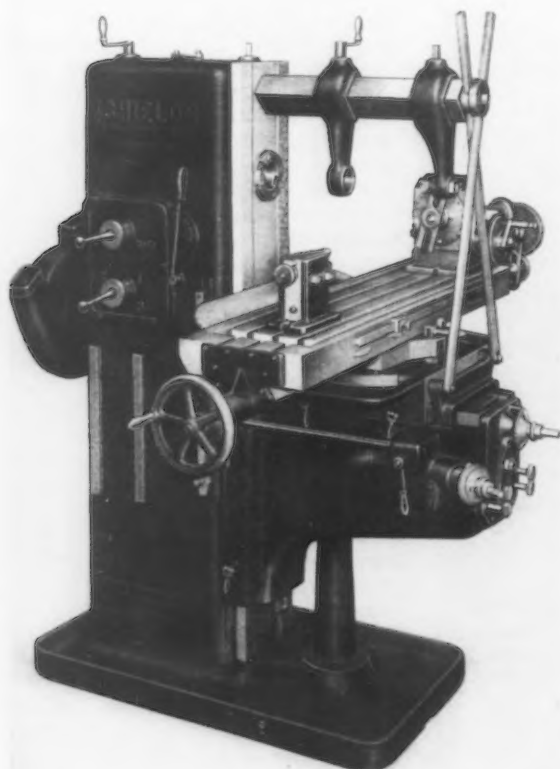
## Metal-Cutting Saw for Aircraft and Other Tubing

**S**EAMLESS steel tubing and formed metal may be cut on a production basis on the Wonder-Metal Worker illustrated, which has been placed on the market by the DeWalt Products Corporation, Leola, Pa.

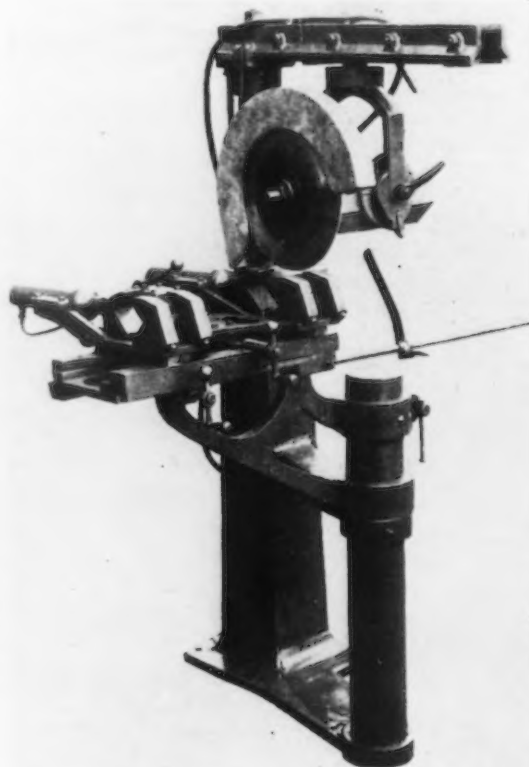
The machine was developed primarily for the angular cutting of molybdenum and other steel tubing used in the fuselage of airplanes but is adapted for use in the manufacture of brass and bronze molding, windshields and other products. It is a 5-hp. overhead direct-drive circular saw with a blade that can be adjusted for cutting at any angle.

The capacity is for tubing up to 3 in. in diameter and  $\frac{1}{8}$  in. wall thickness. The speed is 3600 r.p.m. In addition to rapid operation, clean and accurate cutting are claimed.

The machine is equipped with a 12-in. hollow ground saw, which, it is said, may be operated continuously for three or four days on  $\frac{1}{8}$ -in. molybdenum steel tubing before resharpening. Sharpening is accomplished with an ordinary hand file. In cutting low-carbon steel tubing the saw blade will give eight or ten days' service without resharpening. Manual feed is provided. An air grip vise, de-



Both the Plain and Universal Millers Have the Standardized Spindle Nose, Power Feeds in All Directions, Spindle Reverse, Automatic Coolant System with Patented Pan and Extension Shield



Clean and Accurate Cutting of Steel and Other Tubing Is Claimed for the Saw Shown at the Right

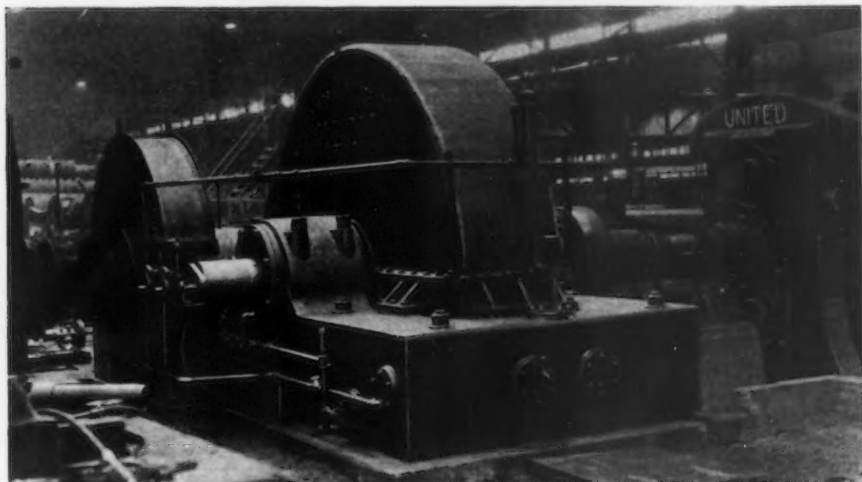
veloped by the Travel Air Mfg. Co., Wichita, Kan., is employed for holding the work. This device, the jaws

of which are adjustable to handle tubing up to 3-in. diameter, is simple in design and rapid in operation.

## Large Roller Bearing Gear Reduction Unit

**W**HAT is believed to be one of the largest roller bearing herringbone gear reducing units ever built has recently been installed in the plant

peak loads) a.c. motor at 360 r.p.m. to two stands of 28-in. bar mills. It is interesting to note that two 8-ft. flywheels, each weighing 16,000 lb., are



Speed-Reducing Set Featuring Roller Bearings and Herringbone Gears

of the Timken Roller Bearing Co., at Canton, Ohio. This unit represents a distinct step forward, for it demonstrates the practicability of roller bearings on equipment of this type. It is completely equipped with Timken tapered roller bearings on both pinion and gear shafts.

It was designed and built by Gears & Forgings, Inc., Cleveland, to transmit power from a 1500-hp. (4000-hp.

mounted on the pinion shaft to take care of the peak loads resulting from the mills.

Gears & Forgings, Inc., is at present building a 1000-hp. herringbone reduction unit for a seamless tube piercing mill for the Timken company's new tube mill and a herringbone gear tandem sheet mill drive for the new tin mill of the Columbia Steel Mill, Pittsburg, Cal.

## Special Butt Welder for Bands and Rings

**R**INGS rolled up from bar stock and ranging in size from 6¼ in. wide, ¾ in. thick and 12 in. inside diameter up to 15 in. wide, 2½ in. thick and 27 in. inside diameter, can be handled on a special butt welding machine recently developed by the Thomson Electric Welding Co., Lynn, Mass. Rings up to 16 in. wide can be welded if the cross-section at the point of weld does not exceed approximately 12 sq. in.

The capacity of the water cooled transformer is 500 kva. Clamping arms and beams are of steel plate and the ears that carry the main fulcrum pins of the four clamping arms are cast integral with the platens. Each pair of clamping arms is opened and closed by hand lever at the front of the welder. After clamping arms have been brought to the closed position, final clamping pressure is obtained through four hydraulic cylinders. Each pair of cylinders is controlled by separate valves and the cylinders are designed to operate on a 1500-lb. pressure line. The total clamping pressure from each clamping cylinder is 56,000 lb., or 112,000 lb. on each die.

Two clamping beams which pass through the bands or frames to be welded are counterbalanced and are

designed to be supported from overhead through a special spring suspension device. When the clamping arms are in the open position, these clamping beams may be pulled directly back through the rings or bands to the rear of the welder, thus permitting the insertion and removal of the work.

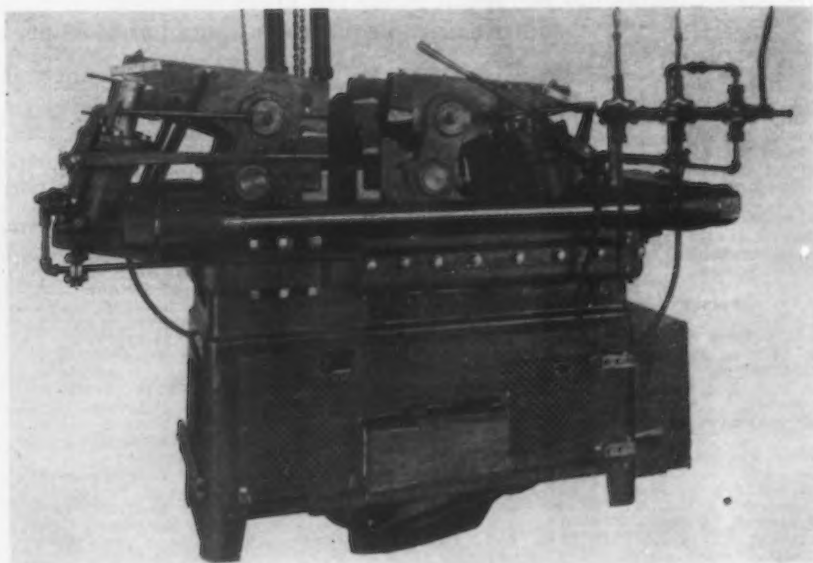
The pressure device consists of a hydraulic cylinder having an area of 60 sq. in., and is designed for use with initial pressure of 1500 to 1600 lb. per sq. in. An initial pressure of 1500 lb. gives total push-up pressure of 90,000 lb., this high pressure being required to overcome stiffness of rings or bands rolled up from heavy stock. The stroke of hydraulic cylinder is 4 in., with a minimum platen opening of ¼ in., giving a total maximum platen opening of 4¼ in. between welding dies. The return of pressure cylinder to the open position is by means of a small hydraulic cylinder.

The distance from the floor to top of welding dies is approximately 50 in. The approximate overall dimensions are: Width 6 ft., length 9 ft., and height 5½ ft.

## High Factory Wages Continue

Average weekly earnings in representative New York State factories are reported by the State Industrial Commissioner at \$29.62 for November. While this is below the record figure of \$29.78 registered in October, and is slightly below the September and March figures of last year and the March total of 1927, it is otherwise the highest figure ever reached.

For the 11 months of 1928 the average figure was \$29.39, compared with an average of \$29.30 for the whole of 1927, \$29.02 for 1926 and smaller figures in earlier years. The average was only \$12.85 in 1915.



Small Diameter Rings from 6¼ to 15 In. Wide Are Welded on the Machine. Motor frames and pipe couplings are examples of the work for which it was designed

# France and England in Better Condition

Stiffer Prices and Larger Orders in Hand—German Output  
Below Quota—France Lacks Adequate Labor

(By Cablegram)

LONDON, ENGLAND, Feb. 11.

**F**URTHER improvement is noted in the pig iron position and prices have been advanced 1s. to 1s. 6d. (24c. to 37c.) a ton. Supplies are short and furnacemen are hesitant to increase production [though blowing in additional furnaces].

The coal trade is improving and some shortage of supplies is now apparent, particularly in export grades. But colliery owners are unable to increase production much, because of the attitude of trade unions and the labor element. Coke is firm and dearer.

Export demand for finished steel is better and decent-sized sales of ship building material have been made lately to Japan. Swan, Hunter & Wigham Richardson, Ltd., Wallsend-on-Tyne, has received from the Egyptian Government an order for a troopship, to cost £100,000 (\$485,000). R. W. Hawthorne, Leslie & Co., Ltd., Newcastle-on-Tyne, has an order for a 8500-ton cargo ship.

Less foreign steel is available now and prices here are stiffening. Prompt deliveries, especially, are hard to obtain.

The capital reconstruction scheme for Sir W. G. Armstrong, Whitworth & Co., Newcastle-on-Tyne, is very complicated, but in effect it shows that losses actually exceed the company's capital. Total losses are above £14,000,000 (\$67,900,000), against issued share capital of little over £10,-

000,000 (\$48,500,000). The scheme provides for reducing the debenture debt by £11,000,000 (\$53,350,000) and share capital by £5,000,000 (\$24,250,000). Losses include about £5,000,000 written off plant, etc., £3,000,000 off Newfoundland and Canadian investments, £1,250,000 off Italian works, £1,500,000 off Pearson & Knowles Coal & Iron Co., Ltd., Warrington, and £2,000,000 additional loss on general investments.

Tin plate markets are quiet and inquiry is small, but works generally are well placed on restricted output.

Galvanized sheets maintain moderate activity in small lines. Black sheet markets, generally, are dull.

French production in December included 880,000 (metric) tons of pig iron and 828,000 tons of raw steel. These make, for the year, 10,097,000 tons of pig iron and 9,387,000 tons of raw steel.

## French Mill Deliveries Extended

Shortage of Skilled Labor Continues—Pig Iron Advance  
Follows British Increase—Exports Large

PARIS, FRANCE, Jan. 28.—There is still a shortage of skilled labor at French steel mills, but otherwise producers are enjoying a moderate degree of prosperity, with the market firm and continued buying in prospect through the present quarter.

No decision has been made on the establishment of a sheet comptoir, but negotiations are to be resumed at some future time. As a result, continuation of the comptoir for semi-finished material and beams appears uncertain, its permanent establishment being subject to the formation of a sheet comptoir prior to June 30. A similar situation exists in the Wire Rod Entente, which was formed

in 1927, upon the understanding that a comptoir for wire products would be organized.

The price of No. 3 phosphoric foundry iron has been advanced 25 fr. (98c.) per ton, but foundry consumers express satisfaction, as it is announced that there will be no further revision of price until June 30. Concessions, which had been appearing in sales to foundries in the north of France, have been eliminated. The advance in price is attributed in part to the recent increase in the price of British Midland iron from £2 15s. (\$13.33) per ton to £3 (\$14.55) per ton, or about 31 fr. (\$1.21) per ton.

Steel prices are firm in the domes-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works with American equivalent figured at \$4.85 per £ as follows:

Durham coke, del'd....	£0 18s.		\$4.37	
Bilbao Rubio ore.....	1 2	to £1 2½s.	5.34	to \$5.46
Cleveland No. 1 foundry	3 9½		16.85	
Cleveland No. 3 foundry	3 7		16.25	
Cleveland No. 4 foundry	3 6		16.00	
Cleveland No. 4 forge..	3 5½		15.88	
Cleveland basic (nom.)	3 5		15.76	
East Coast mixed.....	3 11½		17.34	
East Coast hematite....	3 12		17.46	
Rails, 60 lb. and up....	7 15	to 8 5	37.59	to 40.01
Billets .....	6 5	to 6 10	30.31	to 31.53
Ferromanganese .....	13 15		66.69	
Ferromanganese (export) .....	14 0		67.90	
Sheet and tin plate bars, Welsh .....	6 0		29.10	
Tin plate, base box....	0 18	to 0 18½	4.37	to 4.43
Black sheets, Japanese specifications .....	13 7½		64.87	
Ship plates.....	7 12½	to 8 2½	1.66	to 1.76
Boiler plates.....	9 0	to 10 10	1.95	to 2.27
Tees .....	8 2½	to 8 12½	1.76	to 1.86
Channels .....	7 7½	to 7 17½	1.60	to 1.71
Beams .....	7 2½	to 7 12½	1.55	to 1.65
Round bars, ¾ to 3 in.	7 15	to 8 5	1.67	to 1.78
Steel hoops .....	9 0	to 10 0	1.95	to 2.16
Black sheets, 24 gage..	10 0		2.16	
Galv. sheets, 24 gage..	13 12½	to 13 15	2.95	to 2.98
Cold rolled steel strip, 20 gage (nom.).....	12 0		2.64	

\*Ex-ship, Tees, nominal.  
(a) Nominal.

## Continental Prices All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):				
Belgium .....	£3 6s.	to £3 10s.	\$16.00	to \$16.97
France .....	3 6	to 3 10	16.00	to 16.97
Luxemburg .....	3 6	to 3 10	16.00	to 16.97
Basic pig iron (a):				
Belgium .....	3 6		16.00	
France .....	3 6		16.00	
Luxemburg .....	3 6		16.00	
Coke .....	0 18		4.37	
Billets:				
Belgium .....	5 3½		25.10	
France .....	5 3½		25.10	
Merchant bars:				
Belgium .....	6 5	to 6 6	1.37	to 1.38
France .....	6 5	to 6 6	1.37	to 1.38
Luxemburg .....	6 5	to 6 6	1.37	to 1.38
Joists (beams):				
Belgium .....	5 3½	to 5 5	1.14	to 1.16
France .....	5 3½	to 5 5	1.14	to 1.16
Luxemburg .....	5 3½	to 5 5	1.14	to 1.16
Angles:				
Belgium .....	6 2½		1.33	
½-in. plate:				
Belgium (a).....	6 11½	to 6 12	1.44	to 1.45
Germany (a).....	6 11½	to 6 12	1.44	to 1.45
⅞-in. ship plate:				
Belgium .....	6 6	to 6 7	1.38	to 1.39
Luxemburg .....	6 6	to 6 7	1.38	to 1.39
Sheets, heavy:				
Belgium .....	6 1		1.31	
Germany .....	6 1		1.31	

tic market, although there has recently been some slackening in the volume of buying. Mills, however, are well booked with business and are still offering rather extended deliveries. The export market is also less active, but steel bars are quoted at a minimum of £6 5s. per ton (\$1.37 per lb.) f.o.b. Antwerp. Deliveries range from 10 to 14 weeks, depending upon the product, and certain works are unable to quote better than about five months.

Despite the failure of negotiations to establish a sheet comptoir, the sheet market continues firm and in some instances mills are offering up to two months' delivery on medium gages. Light gages are firm and show a slight tendency to advance. Demand for cold-rolled hoops is active. The next meeting of the International Hoop Cartel is scheduled for

Feb. 7, in Paris. It is expected that the agreement will be renewed, although no French producers are members.

French producers of tin plate are pressing to expand their output, which has reached a rate of about 95,000 tons (about 950,000 base boxes) annually.

In the 12 months of 1928 France exported a total of 2,540,700 metric tons of rolled steel products and imported only 14,836 tons. Pig iron exports reached a total of 626,557 metric tons, with imports at 14,378 tons. Exports of wire rods reached a total of 248,230 metric tons, while imports were only 296 tons. Rail shipments abroad were 382,276 tons and imports 3945 tons. Shipments of hoops totaled 122,220 tons, while 1130 tons was imported.

## Germany Expects Increase in Exports

Sees Improvement in Far East—Pig Iron Costs Said to Be Highest in Europe—May Withdraw from Cartel

BERLIN, GERMANY, Jan. 25.—The outlook for domestic business in the next few months is doubtful, but export trade is showing considerable improvement. At recent meetings of stockholders of steel mills, however, rather pessimistic statements have been made on the future trend of exports. The absolute necessity for increased exports of iron and steel has been pointed out, but at the same time it is estimated that the cost of producing pig iron in France and Belgium does not exceed two-thirds of the average cost in Germany. However, it is noteworthy that the leading steel producers of Germany, such as Friedrich Krupp A. G., Essen, and the Vereinigte Stahlwerke A. G., Düsseldorf, have recently reported expansion of their production, and the Krupp works is planning modernization of its equipment and the addition of new lines of metal products.

### Export Prices Advance

Despite the lull in domestic business, export demand has been active and prices, particularly on recent sales of billets, bars and bands and sheets in certain qualities and gages, have registered advances. The latest Hamburg quotations on rolled products are 2s. to 3s. (48c. to 73c.) per ton higher than in the middle of December. In some quarters a general increase in the world market demand for iron and steel is expected, in part based on the improvement of conditions in the Far East. Meanwhile, German consumption during the present year is expected to be considerably less than in 1927 and previous years.

While the market for iron ore is quiet, the outlook is considered favorable. Although an official inquiry into the Siegerland ore industry, which has been receiving financial aid from the Government, showed that even with

State assistance the mines were barely able to operate without a loss, there is a continued demand for a State subsidy to support the industry.

### Export Rebates Revised

Both reductions and increases have been made in the Ingot Steel Syndicate's price rebates for February to exporting manufacturers. Compared with the rebates in January, those on ingots, slabs, heavy railroad material and wire rods are unchanged. The bloom rebate has been increased from 14 m. (\$3.32) to 16 m. (\$3.79) per ton and that on billets has been reduced from 15 m. (\$3.55) to 14 m. (\$3.32) per ton. The rebate on structural shapes has been advanced from 32 m. (\$7.58) to 33.50 m. (\$7.94) per ton and that on heavy-gage sheets from 24 m. (\$5.69) to 25 m. (\$5.93) a ton.

Efforts have been renewed to form a German syndicate to control light-gage sheets, but strong opposition continues from the Hoesch Steel Works, which produces high-quality sheets under the trade name of "Hoesch Bleche," a market for which is assured even when there is poor business in ordinary sheets. The Vereinigte Stahlwerke A. G., the Mannesmann company and Otto Wolff & Co., are urging the establishment of a syndicate. Otto Wolff & Co. recently acquired control of some small, thin-gage sheet mills in the Siegerland.

### Germany May Withdraw from Cartel

The next meeting of the International Steel Cartel is scheduled for March 14, and is being awaited with great interest, as any member is free to withdraw from the cartel in October, if notice is given by April 1. Commenting on a reported statement by Dr. Julius Klein of the United

States Department of Commerce that the United States has gained and not lost as a result of the cartel, the German trade press declares that he merely states conversely that Germany has not gained by membership in the cartel. A rather general opinion seems to be that unless Germany, by negotiation, obtains an increase in its general quota and in its export allotment, which is now 300,000 tons a month, and the cartel members agree to establish separate international selling syndicates for each product, the German mills must give notice of withdrawal on April 1.

There is, however, a group in the German steel industry that opposes dissolution of the International Steel Cartel, but considers that the advantage of the syndicate to France, Belgium and Luxemburg is so great that they will consent to a revision of the German quota.

### Need of Increased Quota in Cartel

A recent estimate of national capacities and allotments of production in the cartel serves in part to explain the German attitude. The production capacities given are based on 1927 output, but it is pointed out that the cartel quotas are also on the basis of that year.

	Capacity, Metric Tons	Capacity, Per Cent	Cartel Quota, Per Cent
Germany ...	17,500,000	48.4	43.18
France .....	9,500,000	26.3	31.18
Belgium ....	4,000,000	11.1	11.56
Luxemburg ..	2,600,000	7.2	8.30
Saar .....	2,500,000	6.9	5.78

Opponents of German adherence to the steel cartel lay great stress upon the failure of the cartel to obtain the membership of Great Britain, Poland and Italy. In some instances those opposing the international cartel are also against the continuation of the domestic syndicates. Among these, the "A" products syndicate and the band syndicate expire April 30, 1930, the bar and thick sheet syndicates expire July 31, 1930, and the wire rod syndicate on Dec. 31, 1929. Dissolution of these German syndicates would further reduce the interest of German mills in continued membership in the International Steel Cartel.

A \$2,000,000 bridge is to be constructed at Bangkok, Siam, over the Menam River, as a memorial to the Chakri dynasty, according to a report to the United States Department of Commerce from Bangkok. European and American contractors have been notified by the London representative of the Royal Siamese Railroads, and engineers are now on the ground making preliminary surveys.

"Labor Legislation of 1927" is the title of bulletin No. 470 of the United States Bureau of Labor Statistics. It comprises in 90 pages—a compendium of the legislative acts of the various States with regard to all matters pertaining to labor and employment generally. The index comprises no less than 30 pages, or one-third of the total space.

## German Output Falls Below Cartel Quota

### Receives \$632,000 for Last Quarter But Has Paid \$10,000,000 in Two Years—French Exceed Allotment

BERLIN, GERMANY, Jan. 29.—In the fourth quarter of 1928, France, Belgium and Luxemburg exceeded their production allotments as members of the International Steel Cartel, but Germany, as a result of the lockout in the Ruhr during November, fell 405,000 tons short of its quota. Germany, with an allotment of 3,161,000 metric tons, produced 2,756,000 tons, and France, with a quota of 2,283,000 metric tons, had an output of 2,460,000 tons.

Annual output of steel, in metric tons, by the four leading members of the cartel from 1925 to 1928, inclusive, was as follows:

	Germany	France	Belgium	Luxemburg
1925	12,195,000	7,446,000	2,373,000	2,080,000
1926	12,341,000	8,430,000	3,289,000	2,261,000
1927	16,311,000	8,275,000	3,605,000	2,471,000
1928	14,517,000	9,387,000	3,821,000	2,572,000

German output below the quota for the last quarter of 1928 was 405,000 tons, but, under Article 7 of the Cartel agreement, a premium of \$2 a ton is payable only on 10 per cent, or 316,000 tons of the allotment, so that

Germany will receive \$632,000. Since October, 1926, when the cartel was organized, Germany has paid in for excess output a total of about \$10,000,000. France fares better than Germany has in the past, as a revision of the fine system was made last year. Instead of a flat penalty of \$4 a ton for excess production, the fines are now \$1 a ton for the first 7.5 per cent of excess, \$2 a ton for the next 2.5 per cent of excess and \$4 a ton when the excess is more than 10 per cent of the quota. During the greater part of the existence of the cartel, Germany has paid the full penalty of \$4 a ton. The cartel agreement also limits Germany's total exports of steel to 300,000 tons a month and provides that if exports exceed 28 per cent of combined domestic and foreign sales a \$4 a ton fine is incurred. A revision of the cartel agreement will be demanded by Germany at the next meeting, March 14, and it is not believed that France will offer much opposition.

## Industrial Heating Conference in New England

Four technical sessions are planned for a conference on industrial heating, to be held at the Massachusetts Institute of Technology, Cambridge, Feb. 28 and March 1. Besides the institute, the sponsors for the conference are the Associated Industries of Massachusetts and the Industrial Heating Committee of the National Electric Light Association. J. L. Faden, chairman of that committee, 39 Boylston Street, Boston, will preside at the opening session.

Papers follow:

"Melting Brass and Other Alloys Electrically," by Robert N. Blakeslee, Ajax Electrothermic Corporation, Trenton, N. J. Discussion by W. A. Patscheider, works engineer Walworth Co., Boston, and H. C. Kendall, plant manager, Rockwood Sprinkler Co., Worcester.

"Soft Metal Melting," by F. W. McChesney, engineer General Electric Co., Schenectady, N. Y.

"Industrial Ovens," by J. E. Randall, engineer Young Brothers Co., Detroit.

"Arc Welding of Steel Frame Structures," by G. D. Fish, consulting engineer, Westinghouse Electric & Mfg. Co., New York. Discussion by George C. Soule, president Maine Steel Products Co., Portland, Me.

"Arc Welding as a Substitute for Castings," by J. F. Lincoln, vice-president Lincoln Electric Co., Cleveland.

"Arc Welding as an Aid in Manufacturing Metal Equipment," by Nathaniel Warshaw, chief engineer Lewis-Shepard Co., Watertown, Mass.

"Theory and Practice in Heat Treating," by Dr. R. S. Williams, professor of metallurgy, Massachusetts Institute of Technology.

"Heat Treating Electrically," by a

metallurgist of the International Harvester Co., Chicago.

"Annealing of Non-Ferrous Metals," by Jewett Schrumm, electrical engineer French Mfg. Co., Waterbury, Conn.

"Vitreous Enameling," by A. D. Dauch, engineer George J. Hagan Co., Pittsburgh.

"Heat Treatment and Production Costs," by A. N. Otis, engineer General Electric Co., Schenectady, N. Y. Discussion by S. D. Fitzsimmons, plant engineer Brown & Sharpe Mfg. Co., Providence, R. I.; H. Klaucke, production engineer Baldwin Chain & Mfg. Co., Worcester, Mass.; L. E. Raymond, Greenfield Tap & Die Corporation, Greenfield, Mass.

"Hardening of Metal Cutting Tools," by A. H. d'Arcambal, consulting metallurgist Pratt & Whitney Co., Hartford, Conn.

"Economics of Industrial Heating Practice," by J. A. Doyle, vice-president W. S. Rockwell Co., New York.

Dr. George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, will preside at the morning session on March 1. The afternoon conference on that day will be held jointly with the Boston Chapter American Society for Steel Treating. The afternoon meeting Feb. 28, is a joint session with the Boston section American Welding Society.

## Historic Foundry, Started in 1781, Is No More

The Foxboro Foundry Co., South Foxboro, Mass., property has been sold to parties who intimate that it will be utilized for other than foundry purposes. So passes one of the pioneer foundries of New England. It was started in 1781 by George Stratton, Uriah Atherton, Joseph Hewes and John Knapp to cast can-

non and cannon balls for the Continental Army. The first casting was poured in 1784. Ore was mined in the town, although a part used in the foundry was brought from New Jersey. Later the foundry made pots and kettles, which were peddled throughout New England.

Berlah Mann purchased the foundry, and in December, 1812, sold it to Gen. Shepard Leach for \$2,050. General Leach operated foundries in North Easton, Chelmsford and other New England towns. Later a Lincoln Drake acquired the property, and on Jan. 28, 1854, sold it to Otis Cary and Maryin Torrey for \$5,500, and they improved it. Otis Cary conducted the business until 1863, when he leased it to Seth Williams. The foundry was burned in 1867 and rebuilt the following year. And so on down through the years the foundry changed hands many times until 1888, when the Foxboro Foundry & Machine Co. was organized. A new machine shop and the foundry were destroyed by fire in September, 1897, soon rebuilt and kept in operation until about 15 years ago, since which time it has been idle.

## Steel Imports Unaffected by Price Revisions

NEW YORK, Feb. 11.—Except for sales of small tonnages of hoops and bands, importers of European steel report business inactive. Current sales of shapes from dock are particularly difficult. Recent price revisions of European mills have failed, thus far, to stimulate imports. A reduction of 1s. (24c.) per ton in the past week applied to bars, beams, angles and wire rods, but not to hoops and bands, in which there is still some business. On the contrary, these latter products were advanced in most cases by 2s. (48c.) per ton. Shapes for future delivery have recently been offered to American consumers at 1.70c. and 1.75c. per lb., duty paid, New York, but importers, as a rule, are quoting 1.85c. to 1.90c. per lb., duty paid. Steel bar prices are too high to permit much business, with most quotations at 2c. to 2.05c. for Thomas quality, structural grade.

Export trade with the Far East continues small, but the recent improvement in the exchange value of the yen is expected by some exporters to result in increased business from Japanese merchants. Some small orders for merchant sizes of tin plate have been taken by Japanese exporters, and 3000 tons out of 16,000 tons of sheet bars recently inquired for by the Kawasaki Dockyard Co. is understood to have been placed with an American mill.

On application to the Department of Commerce, the name of the contractor for a \$1,000,000 by-product coke plant at Fort William, Ont., is available. The plant is being erected to provide gas for Fort William and will have an initial coke production of about 100 tons a day.

# Lake Superior Ore Shipments Up in 1928

Increase 4.8 Per Cent Over 1927—All-Rail Movement  
Smaller—Less Mines Active

**I**RON ore shipments from the Lake Superior district during 1928 amounted to 54,855,641 gross tons, as compared with 52,343,336 tons in 1927, or a gain of 2,512,305 tons, or 4.8 per cent, according to statistics compiled by the Lake Superior Iron Ore Association. Figures previously published included only the water shipments amounting to 53,980,874 tons.

The decrease in all-rail shipments last year was due to an increased movement of ore to St. Louis by water to Chicago and by rail from there by destination instead of entirely by rail, and by the shutting down

a gain of 2; 5 in the Vermilion as in 1927, and one in Mayville-Baraboo, as in the previous year. The amount of ore beneficiated by various methods was 20,305,920 tons, as compared with 19,068,211 tons in 1927. An accompanying table shows the tonnages beneficiated by various methods.

## Locomotive Shipments at Low Ebb

WASHINGTON, Feb. 8.—Railroad locomotives to the number of 23 were shipped in January against 44 in December, according to the Department of Commerce. Of the shipments in January, 12 were for domestic account, being made up of six steam and six electric units, while 11 steam locomotives were exported. The total was the smallest month's grist in over two years, representing only one-half of the average, monthly, in 1928, and little more than one-fourth of the 1927 monthly average of 90.

Exports, however, were exceeded only twice in 1928—by those of July and November. And they were almost precisely the same as the average of the 24 months of 1927 and 1928.

## Smaller Construction Volume in January

Construction contracts awarded in January in the 37 States east of the Rocky Mountains are reported by F. W. Dodge Corporation at \$409,968,000. This shows a decrease of 5 per cent from December and is 4 per cent less than in January, 1928. More than one-third of the total was for residential buildings, which aggregated \$138,069,000. Commercial build-

ings account for \$100,378,000, public works and utilities for \$66,522,000 and industrial projects for \$63,109,000.

New building projects reported in contemplation in January amounted to \$818,234,000, or practically twice the volume of construction awarded. This figure was 13 per cent higher than in the preceding month but about 10 per cent less than in January, 1928.

## Open-Hearth Furnaces at Eddystone, Pa.

Basic open-hearth furnaces of 50 tons capacity are to be installed at the new steel castings plant of the General Steel Castings Corporation, Eddystone, Pa. Arthur L. Stevens Corporation, 205 West Wacker Drive, Chicago, is to be consulting engineer in charge of design for the new furnaces.

As noted in THE IRON AGE of Jan. 10 and Jan. 24, this plant is a joint venture of the American Steel Foundries, American Locomotive Co. and Baldwin Locomotive Works, and will have a building 600 x 1000 ft. on a plot of 120 acres.

## New Record Output of Portland Cement

Portland cement production in 1928 established a new high record, at 175,968,000 bbl., displacing the 1927 record of 171,908,000 bbl. Each month of 1928, except March and April, showed a higher total than the corresponding month of 1927, according to a statement of the United States Bureau of Mines.

Shipments made a new high record, also, at 175,455,000 bbl., compared with 170,922,000 bbl. in 1927. Stocks at the end of 1928 were 22,573,000 bbl., against 22,082,000 bbl. a year earlier. Stocks reached a seasonal maximum of 27,627,000 bbl. on April 30, declining thence to 14,579,000 bbl. at the end of October.

Method of Beneficiation	
Washing .....	5,296,789
Jigging .....	106,853
Drying .....	319,471
Sintering and nodulizing.....	125,388
Total concentrated.....	5,848,501
Crushing and screening*.....	14,457,419
Total beneficiated.....	20,305,920

\*Crushing and screening improves physical structure only and does not change chemical analysis.

of a Mayville, Wis., furnace that when operating takes considerable ore by all-rail shipment.

The largest shipment was made by the Missabe Mountain mine in the Mesaba range, a State-owned mine operated by the Oliver Ore Mining Co., a subsidiary of the United States Steel Corporation. This mine shipped 5,255,947 tons.

There were 168 mines in active operation last year, a decrease of 17 for the year. Of these, 72 were on the Mesaba range, as compared with 86 in 1927. The number of active mines in other districts was 19 in the Gogebic, a loss of one; 25 in the Marquette, a loss of one; 31 in the Menominee, a loss of 3; 15 in the Cuyuna,

		SHIPMENTS BY PORTS AND ALL-RAIL					
		1928	1927	1926	1925	1924	1923
Escanaba .....	5,487,556	5,865,224	6,599,597	5,644,278	4,244,669	5,607,411	4,592,354
Marquette .....	3,410,902	3,238,855	3,417,462	3,457,968	2,516,548	2,789,285	1,976,220
Ashland .....	6,481,158	6,239,774	7,139,865	6,664,501	4,807,565	6,237,449	5,813,207
Two Harbors .....	15,413,694	5,703,159	6,266,272	6,016,096	4,817,494	6,418,464	5,952,437
Superior .....	17,454,063	14,627,936	16,476,264	14,560,477	13,355,214	17,820,476	11,234,240
Duluth .....	5,733,501	15,432,188	18,638,395	17,707,978	12,882,082	20,163,619	13,044,771
Total by lake....	53,980,874	51,107,136	58,537,855	54,081,298	42,623,572	59,036,704	42,613,229
Total by rail....	874,253	1,236,200	1,434,183	1,435,046	1,271,538	1,743,299	1,376,867
Total .....	54,855,127*	52,343,336	59,972,038	55,516,344	43,895,110	60,780,003	43,990,096

\*Slight variation in figures showing shipments from mines and docks is due to small amount of ore left on docks at shipping ports.

		IRON ORE SHIPMENTS BY RANGES					
		1928	1927	1926	1925	1924	1923
Mesabi .....	35,398,660	32,974,157	38,249,793	35,889,988	29,141,665	41,814,463	28,055,394
Marquette .....	6,540,019	4,151,868	4,442,765	4,185,533	3,174,660	3,892,666	2,817,390
Menominee .....	4,841,637	5,211,215	5,945,811	5,268,846	3,836,707	4,854,781	4,078,519
Gogebic .....	4,298,717	6,383,408	7,536,389	7,068,296	5,159,838	6,579,950	6,218,610
Vermilion .....	2,097,716	1,547,732	1,586,054	1,437,577	978,097	1,278,598	1,211,467
Cuyuna .....	1,671,466	1,982,302	2,079,276	1,509,217	1,468,940	2,220,745	1,497,615
Mayville-Baraboo ...	7,426	92,654	131,950	156,887	135,203	138,800	110,101
Total .....	54,855,641	52,343,336	59,972,038	55,516,344	43,895,110	60,780,003	43,990,096

## Malleable Iron Institute Provides Shop Practice Service

A new activity of promising benefits, comprising a plan of shop practice consulting service, has been inaugurated by the Malleable Iron Research Institute, Union Trust Building, Cleveland. J. B. Deisher, Rochester, N. Y., a specialist in malleable iron practice, has been engaged as a shop practice engineer for the conduct of the work. The general scope of his services, which will be given members as an added research activity of the institute, will embrace consultation and advice upon all phases of melting furnace and annealing oven practices and of molding practice, including the gating and feeding of castings. Sectional shop practice meetings of shop men will also be held under the direction of Mr. Deisher for the discussion and consideration of shop problems of general interest and concern.

The institute has for many years conducted laboratory and extensive metallurgical research work under the direction of its consulting engineer, Prof. Enrique Touceda, Albany, N. Y. Certificates of quality assuring integrity of castings have been issued quarterly by the institute to members whose product and plant practice met the requirements of the institute.

A portion of Mr. Deisher's time will be devoted to a still more rigid inspection of castings at plants of member concerns who desire certificates, and will give greater assurance than ever before of integrity of castings shipped by plants which are awarded these certificates at the end of each three months' interval. The plan for making more rigid and frequent inspections, together with the development of a shop practice consulting service, promises further improvement in a product which has already been increased in its usefulness and value through the efforts of those plants composing the membership of the institute.

There will be no change in the conduct or scope of the institute's laboratory and general metallurgical research work, which is in charge of Professor Touceda.

## Heavy Coal Production in January

Mining of bituminous coal in January is estimated by the United States Bureau of Mines at 51,485,000 net tons, or an average of 1,950,000 tons each working day. This is an increase of nearly 19 per cent over the December total of 43,380,000 tons, raised in 25 days, against an average of 26.4 days for January. As the daily average in December was only 1,735,000 tons, January on the daily basis had an increase of over 12 per cent.

Anthracyte mined in January is given as 7,268,000 tons, which represents an increase of almost 17 per cent over the 6,226,000 tons of De-

cember. Beehive coke in January is given as 481,000 tons, a gain of 21 per cent on the 398,000 tons of the preceding month.

Compared with January, 1928, the latest month's figures show a gain in bituminous coal of about 16½ per cent, a gain in anthracite of about 28 per cent and a gain in beehive coke of about 28 per cent.

## Scrap Trade of Middle West to Hold Meetings

Scrap iron dealers of Ohio, Indiana, Illinois, Michigan, Wisconsin, Missouri, Iowa, Kentucky, West Virginia and Kansas will attend three conferences arranged by the Institute of Scrap Iron and Steel, which are scheduled for Cleveland on Feb. 19 at the Statler Hotel; for Cincinnati on Feb. 20 at the Cincinnati Club, and for Chicago on Feb. 21 at the Palmer House. It is expected that new chapters of the institute will be organized at these meetings.

William E. Humphrey, chairman Federal Trade Commission, has accepted the invitation of the institute to be the guest and speaker at the annual banquet at the Pennsylvania Hotel, New York, March 7. The banquet will follow an all-day conference of the scrap iron industry.

## Institute of Metals Offers Technical Program

Supplementing information published in THE IRON AGE, Dec. 27, 1928, page 1651, arrangements have been made for the presence at the annual dinner at the Institute of Metals (British) at its "Coming-of-Age" celebrations in London, March 13 and 14, of Lord Melchett and Sir Samuel Hoare.

A feature of the celebrations this year is a "conversazione" which is to be held in the Science Museum at South Kensington on the evening of Thursday, March 14. Dr. W. Rosenhain, president of the institute, and Mrs. Rosenhain will receive members and their friends. In addition to the many interesting objects normally on view in this museum, there will be special exhibits of metallurgical interest arranged by the institute.

The technical program arranged is as follows:

"Recent Development in Electric Furnaces," by D. F. Campbell.

"An Improved Form of Electric Resistance Furnace," by W. Rosenhain.

"Note on the Testing of Electrodeposits on Aluminum," by G. B. Brook and G. H. Stott.

"The Importance of Design, and Setting of Large Kettles Used for Refining and Low-Melting Point Alloys," by H. C. Lancaster.

"Brittleness in Arsenical Copper—II," by Clement Blazey.

"Special Properties of Eutectics and Eutectoid Alloys in Binary Metallic Systems," by Prof. P. Saldau.

"Work-Softening and a Theory of Inter-crystalline Cohesion," by F. Hargreaves and R. J. Hills.

"The Age-Hardening of Some Aluminum Alloys," by Marie L. V. Gayler and G. D. Preston.

"The Constitution of the Cadmium-Rich Alloys of the System Cadmium-Gold," by P. J. Durrant.

"The System Magnesium-Zinc," by W. Hume-Rothery and E. Rounsefell.

"Alloys of Zirconium—II," by C. Sykes.

"The Resistance of Zinc to Indentation (A Preliminary Account)," by J. Newton Friend and W. E. Thorneycroft.

"The Solution of Plain and Amalgamated Zincs in Electric Batteries," by J. Newton Friend.

"The Silver Contents of Specimens of Ancient and Mediaeval Lead," by J. Newton Friend and W. E. Thorneycroft.

"A Note on the Houghton-Hanson Thermostat. A Method of Fine Adjustment," by P. J. Durrant.

## Reinforcing Steel Institute to Meet in April

The Concrete Reinforcing Steel Institute will hold its fifth annual meeting at Kenilworth Inn, Asheville, N. C., April 15 to 17.

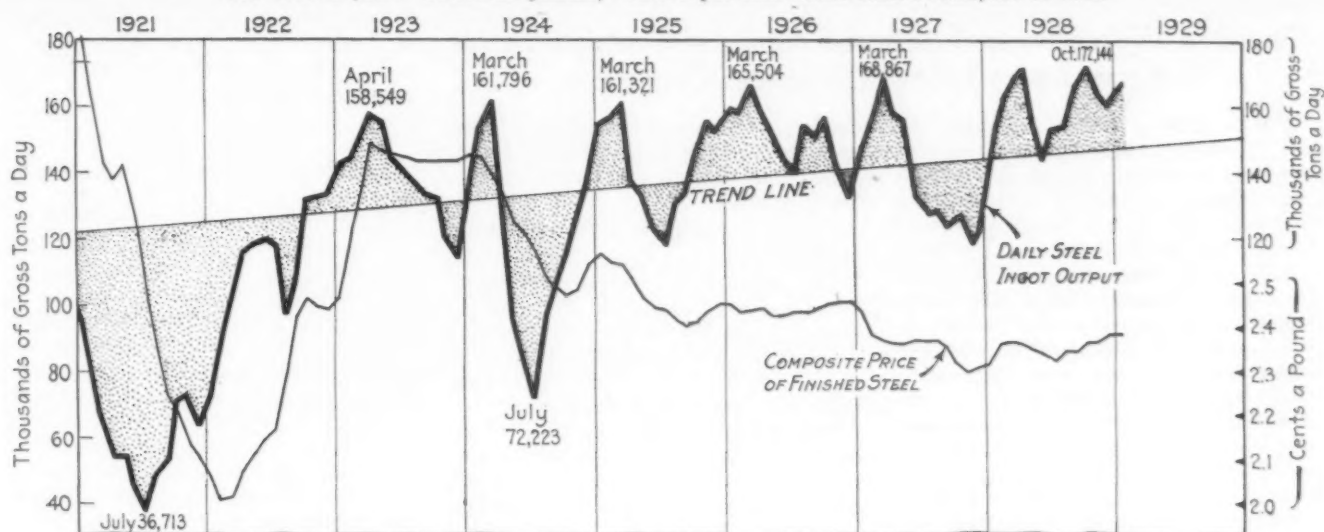
The president's address and committee reports will feature the program for the first day. On Tuesday, April 16, O. W. Irwin, vice-president Truscon Steel Co., will deliver an address on "Current Events," while W. S. Thompson, chief engineer Kalman Steel Co., will talk on "Engineering Costs." A representative of the Portland Cement Association will discuss "New Markets for Reinforcing Steel." Concrete ribbed floor construction will be the subject of a symposium at an evening session, April 17. A golf tournament and motor trips are among the entertainment features provided. M. A. Beman, Tribune Tower, Chicago, is secretary of the institute.

## Testing Society's Group Meeting at Chicago

The annual spring group meeting of certain committees of the American Society for Testing Materials will be held this year at Chicago at the Stevens Hotel, March 19 to 22. The holding of one of these group meetings in the Middle West is in line with the general policy of carrying the work of the society to the several sections of the country. The last two group meetings were held in the East, at Philadelphia in 1926 and at Washington in 1927, with the 1928 and 1929 annual meetings in Atlantic City.

A booklet of 142 pages, issued by the Board of Engineers for Rivers and Harbors of the War Department in cooperation with the United States Shipping Board, gives information relative to consular services and charges, affecting vessels, freight and passenger, moving between the United States and foreign ports. Copies of the booklet are obtainable at 25c. from the Superintendent of Documents, Government Printing Office, Washington.

Ingot Production in January Was the Fourth Largest for Any Month. The trend line shows a normal growth of about 1,013,000 tons a year. Prices in January were 3 per cent better than at midyear of 1928



## Ingot Production Higher in January

Steel Output Greatest for Any January and Fourth Largest for Any Month—  
More Than 12 Per Cent Above January, 1928

**R**ECORD-BREAKING production of steel ingots has continued through January, making that month the largest first month of any year. Figures of the American Iron and Steel Institute show a total of 4,489,391 gross tons, estimated on the basis of reports from companies which made 94.68 per cent of the 1927 output. Except for October, 1928, with 4,647,891 tons; March, 1928, with 4,507,520 tons; and March, 1927, with 4,535,272 tons, last month made the greatest tonnage for any month on record. The largest previous January was in 1925, with a total of 4,193,281 tons.

On the basis of daily averages, January with 166,274 tons is the fifth largest in the history of the industry. It was exceeded by October, 1928,

with 172,144 tons; April, 1928, with 172,103 tons; March, 1928, with 166,945 tons and March, 1927, with 168,867 tons. The current figure compares with 160,777 tons in December, which had only 25 working days, against 27 in January, and with 153,513 tons in January, 1928, with 26 working days.

Something of the extent of the record-breaking character of current steel production may be visualized by noting that 10 of the last 12 months have shown more than 4,000,000 tons in each instance, whereas previous to that period only 13 months in all of the preceding years had passed that amount.

Both open-hearth and Bessemer steel participated in the increase in January. Those companies reporting

showed a gain of 392,000 tons, or practically 12 per cent, in open-hearth steel, and a gain of 53,000 tons, or practically 11 per cent, in Bessemer steel.

All of these figures are for Bessemer and open-hearth steel only, as the institute no longer reports monthly figures for electric and crucible steel ingots. Production of electric and crucible steel ingots in 1927, the latest year for which data are available, was 378,974 tons, or a daily average of 1219 tons.

### Strip Mill at Steubenville Nearing Completion

Work on the new strip mill now under construction at the Steubenville plant of the Wheeling Steel Corporation is nearing completion. It is expected that this mill will get under way in about four weeks. Some of the equipment has been turned over. This mill, built by the Mesta Machine Co., is of a new design. The General Electric Co. furnished the electrical equipment.

### Ward Line Orders Two 16,000-Ton Steamships

WASHINGTON, Feb. 11—Contracts for the construction of two combination passenger cargo vessels of approximately 16,000 tons displacement have been placed with the Newport News Shipbuilding & Dry Dock Co. by the Atlantic Gulf & West Indies Steamship Lines. The vessels are for service on the Ward Line between New York and Havana. Loans for aid in constructing them were obtained from the Shipping Board.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS  
(GROSS TONS)

1928 Months	Reported by Companies Which Made 94.68 Per Cent of the Steel Ingots in 1927		Calculated Monthly Output All Companies	No. of Working Days	Approximate Daily Output All Companies
	Open-Hearth	Bessemer			
January .....	3,280,247	498,746	3,991,332	26	153,513
February .....	3,308,728	521,366	4,045,304	25	161,812
March .....	3,700,411	567,309	4,507,520	27	166,945
April .....	3,509,637	564,039	4,302,573	25	172,103
May .....	3,397,631	581,949	4,203,190	27	155,674
June .....	3,016,487	527,351	3,742,964	26	143,960
July .....	3,075,247	533,550	3,811,573	25	152,463
August .....	3,386,750	569,436	4,178,481	27	154,759
September .....	3,381,917	545,015	4,147,583	25	165,903
October .....	3,802,396	598,227	4,647,891	27	172,144
November .....	3,441,985	590,796	4,259,380	26	163,822
December* .....	3,308,872	496,726	4,019,432	25	160,777
Year* .....	40,610,308	6,594,510	49,857,223	311	160,313
1929 January .....	3,700,939	549,616	4,489,391	27	166,274

\*Revised.

## Iron Foundries to Pool Output Figures

Those in Worcester and Suburbs Agree to Furnish Totals to Serve As an Index of Business Conditions

THE jobbing iron foundries of Worcester, Mass., have entered into an agreement under which each will furnish confidential figures of its business each month to the secretary of the Industrial Bureau of the local Chamber of Commerce, who will collate the information into totals which will be distributed to the parties to the agreement, that each may make comparison of his own experience with that of the average of his contemporaries. The foundries concerned are members of the Foundry Council of the Chamber of Commerce and comprise nearly all of those doing a jobbing business in Worcester, together with two suburban foundries, a large part of the output of which is sold to Worcester machine shops.

The figures will include total production, total sales, prices at which castings are sold and base production costs.

The eleven foundries concerned are the Arcade Malleable Iron Co., which furnishes most of the malleable castings used by Worcester manufacturers; Holyoke Machine Co., Jackson Street Foundry Co., L. W. Pond Machine & Iron Co., R. P. Power Foundry Co., Reed-Prentice Corporation, Standard Foundry Co., Washburn Shops of the Worcester Polytechnic Institute, and Worcester Foundry

Co., all of Worcester, and the Framingham Foundries, Inc., Framingham, Mass., and the Milford Iron Foundry, Milford, Mass.

The total output in 1928 was about 21,000 tons.

The other large iron foundries of the city are departments of manufacturing companies such as the Crompton & Knowles Loom Works, textile machinery, and the Rice, Barton & Fales Co., paper mill machinery.

The monthly reports of total foundry production, which figure is the only one to be made public, will be regarded as an excellent early-acting barometer of business conditions in the machine shops, particularly, though not solely, in the machine tool building establishments.

Figures for 1928 have been compiled, and follow very closely other statistics of economic conditions. They are totaled in pounds as follows:

January .....	2,914,072
February .....	3,344,557
March .....	3,766,107
April .....	3,504,179
May .....	3,683,065
June .....	3,439,880
July .....	3,465,559
August .....	3,181,115
September .....	3,110,968
October .....	3,709,744
November .....	3,981,883
December .....	4,175,119

Total ..... 42,276,248

## "Educational Orders" Bill Reported Favorably

WASHINGTON, Feb. 11.—The House Committee on Military Affairs has made a unanimously favorable report on the bill providing for placing educational orders with private plants by the Secretary of War during peace times so that they be readily converted for war production purposes. The measure authorizes the Secretary of War to expend not to exceed \$1,000,000 in each of the next succeeding five fiscal years after passage of the act out of funds under control of the War Department.

## To Promote Mechanization of Coal Mines

Active cooperation of coal operators throughout the country in its five year mechanization program looking to introduction of machinery in the mining of coal to advance the safety of the miner and the productive processes of the industry has been requested by the American Mining Congress.

In a letter to every coal operator, the organization, through Dr. L. E. Young, Pittsburgh, vice-president of the Pittsburgh Coal Co., who is chairman of the national committee on mechanized mining, points out that the

activity of the committee, which is nation-wide in scope, embracing State and district representatives in every coal field, is of vital importance if the owners of coal mining enterprises are to survive the present intensive competition.

## Ferromanganese for Export from South Africa

Making ferromanganese for export is being seriously considered in South Africa. Natal is reported interested in a scheme to employ surplus electric power, generated at Colenso, for this purpose.

The rich manganese ore from the Postmasburg fields would be utilized as the basis of the industry; and nothing, it is said, is lacking to the success of the scheme but the sympathetic cooperation of the railroads. The extension of the Koopmansfontein line to Postmasburg is every day coming nearer, and will doubtless be sanctioned during the next session of the Union Parliament. Incidentally, says the *South African Mining Journal*, it should be mentioned that the 40-ft. depth of the manganese bed on the farms Doornfontein and Beestekraal, belonging to the Union Manganese Corporation, should have been emphasized.

British ferromanganese producers

export a good deal, and there is the American company which makes the ferroalloy electrically in Norway and in Canada from West African ores and exports it to the United States, England and other countries.

## Anti-Injunction Bill Scored By Manufacturers' Counsel

WASHINGTON, Feb. 11.—Certain militant groups are attempting to subordinate the judicial branch of the Federal Government to the legislative, according to John C. Gall, associate counsel of the National Association of Manufacturers, who addressed the annual convention of the Sand Lime Brick Manufacturers at the Bureau of Standards last Wednesday. To a large extent, he declared, this movement is aimed directly at the manufacturer or producer, either through determined efforts to regulate the conditions under which he operates or to establish Government operations to compete with him.

In the course of his remarks, Mr. Gall referred to the Shipstead anti-injunction measure. The original, it was stated, had been abandoned because of its extreme character, but the substitute was declared to be even more objectionable. The bill was described as being predicated primarily on the union declaration that "the individual unorganized worker is commonly helpless to exercise actual liberty of contract and protect his freedom of labor." Mr. Gall said that the bill proceeds to outlaw, by rendering unenforceable, any contract by which any party agrees not to become or remain a member of a labor or an employers' organization.

"It sanctifies nine groups of acts," said Mr. Gall, "by providing that no court of the United States shall have jurisdiction, in any case arising out of a labor dispute, to enjoin any person from doing any of them, either singly or in combination with others." Among these are striking; supporting a strike, as by payment of benefits; giving publicity to facts involved in a labor dispute by any means not involving fraud or violence.

Mr. Gall contended that the bill undertakes to reverse completely, as to unions, the ancient and salutary rule that one is responsible for the acts of his agents, within the scope of the authority granted, by relieving the union of any responsibility for the unlawful acts of its agents unless there is actual proof of express authorization or ratification after the acts have been accomplished.

The electrification of the rod mill of the Gulf States Steel Co., Alabama City, Ala., and the electrification of the rail rerolling mill of the Pollak Steel Co., Marion, Ohio, are described in illustrated articles in the February issue of *Freyn Design*, house organ of the Freyn Engineering Co., 310 South Michigan Avenue, Chicago.

# This Issue in Brief

By adding wheels to skids, plant cuts production costs. Wheeled skids have variety of uses: For serving production machines, for unloading freight cars, for carrying materials from one department to another, and even as stock racks. They are home-made, and mostly welded.—Page 467.

\* \* \*

One million dollars' worth of scrap is consumed daily, engineer estimates. About half is consumed in the plants in which it is produced. The other half is market scrap. Consumption has doubled in 15 years.—Page 471.

\* \* \*

Blanket automobile insurance policy saves money for Crane Co. employees. More than 800 employee-owned cars are covered by a single low-cost policy. This and other personal helps create friendly employer-employee relations.—Page 474.

\* \* \*

Shattered blast furnace linings caused by free iron oxides in fire brick, refractory manufacturer discovers. Ferric oxides cause brick to accumulate carbon, which brings about disintegration of the lining, even at relatively low temperatures.—Page 480.

\* \* \*

High temperatures and high loads decrease the stability of metals. At about 3000 lb. to sq. in., steel pipe at 1250 deg. Fahr. had run more than 2250 hr. without showing distress. But investigators find that the destruction of pipe proceeds rapidly when load is enough to subject it to heavy tensile stress.—Page 476.

For hardening tool steels, electric heat treating is preferable, says British metallurgist. For, he declares, electric heat provides the high temperatures necessary in correct hardening, and also extremely accurate temperature control.—Page 476.

\* \* \*

Eliminates shrinkage cracks in steel casting of axle housing by adding extra metal to corners, where cracks develop. Afterward, motor truck builder machines off the extra metal.—Page 477.

\* \* \*

New January record in steel ingot output was established last month. Daily production averaged 166,274 gross tons, a gain of 3.6 per cent over December.—Page 495.

\* \* \*

Expansion of quenched steels is due to expansion of space lattice, says Japanese metallurgist. The plane at right angles to the plane of maximal atomic density is subject to the greatest internal stress.—Page 476.

\* \* \*

Develops 480 hp. with 865-lb. engine. Rolls-Royce 12-cylinder aircraft engine is aluminum, with valves of high-silicon-chromium steel, and camshafts of 5 per cent nickel steel machined from the solid.—Page 482.

\* \* \*

Each foundry knows how much of the total business it is getting. Iron foundries in Worcester, Mass., pool their figures, and local chamber of commerce furnishes each foundry with the aggregate figure for the month.—Page 496.

Employers' interests endangered by anti-injunction bill, association counsel indicates. Shipstead bill would outlaw employer-employee contracts concerning union membership.—Page 496.

\* \* \*

Zinc-cadmium solder flows over cold-drawn steel without tempering the steel and yet the solder remains firm in enamel baking oven. This solder, called "cazin," is used on end connections of steel cables on British dirigibles. Shear strength of cazin is as high as 25,000 lb. per sq. in.—Page 478.

\* \* \*

Family difficulties, shop disputes, and other personal problems are handled by employees' advisory department. Crane Co. encourages workers to consult privately with adviser, who helps them adjust family and shop troubles.—Page 474.

\* \* \*

Severe competition in automobile industry is indicated, says Dr. Haney. "Most observers agree that there is a distinct possibility of over-production."—Page 483.

\* \* \*

Production per employee doubled in 15 years in blast furnace industry. Per 100 man-hours, output was 14 gross tons in 1911, and 30 tons in 1927.—Page 476.

\* \* \*

Welded steel reels are displacing wood in textile industry. Steel reels last longer, eliminate troublesome splinters, do not warp, and have greater capacity.—Page 476.

A. I. FINDLEY  
Editor

# THE IRON AGE

W. W. MACON  
Managing Editor

ESTABLISHED 1855

## Conditions and Prospects

**T**HERE is a divergence between the actual conditions in steel at the moment and what are considered the prospects. The conditions are very good, the prospects seem not so good. How shall one judge?

That there are seasonal trends in steel demand, to a moderate extent in the total and to a great extent in some individual consuming lines, is well recognized. There is ground also for another generalization—that there is some seasonal fluctuation in trade sentiment. With the disposition before and during the holidays to predict good things for the new year we are all familiar. Afterward there is a reaction in sentiment. While the individual may think he is not impressed by the predictions, unconsciously at least he is, and he proceeds to pick flaws as the early weeks of the new year pass.

It is not uncommon to hear in January that things are not moving well. If the mills are busy it may be said that they are "simply running on old orders." Sometimes it takes a good deal in actual developments to overcome this attitude of question. Last year as late as the end of February there was talk that steel affairs were not doing so well as had been expected. The outcome was quite to the contrary. For four successive years steel ingot production had peaked in March, but last year it peaked in April instead, and the subsequent recession, instead of being prolonged into July as formerly, ran only into June, July bringing an increase. The criticism at the end of February turned out to have been misplaced. As to the second half of the year, it broke the second-half record by a much wider margin than that by which the first half had broken the first-half record.

Sifted down, much of the doubt about the future encountered of late focuses upon one thing—high money rates. The danger to business from the increasing cost of credit arising from speculative excesses was given official recognition in a statement by the Federal Reserve Board on Feb. 7. A member bank, said the board, is not within its reasonable claims for rediscount facilities at its Federal Reserve Bank when it borrows either for the purpose of making or maintaining speculative loans. Just what action will be taken to stem such extension of credit is not made clear, but it is evident that the Reserve Board has definitely committed itself to a policy of restraining speculation, and the results should be salutary from the standpoint of the credit needs of industry and trade.

Meanwhile buying of finished steel is still in large volume, although mainly for prompt shipment, which means that buyers still are not taking chances.

## Scrap Supplies and Prices

**B**EFORE January business was well under way, the average price of heavy melting steel scrap, delivered in Eastern Pennsylvania, Pittsburgh and Chicago districts, had risen to the highest in approximately three years. Subsequent advances put the Pittsburgh market at the highest level in four years and the Chicago market at its highest in three and a third years.

In contrast, by the composites of THE IRON AGE pig iron was \$3 a ton lower than three years previous and finished steel products were at least a dollar a ton lower than three years previous. What had happened?

The commonplace remark is that scrap became "scarce"; but that is a vague view. Of course the offerings for sale were less, but if the supplies were in normal volume, if there were no physical scarcity, there would merely be represented some new twists in marketing. It is well known that there was not a speculative operation by which the dealers profited. Their testimony is uniform, that they were getting "hooked" all through the rise from a low point at the middle of last year.

Was there a physical scarcity, an outcome of scrap below normal? There are various suggestions that would indicate the contrary. Centering in last July there was a five-month period of exceptionally heavy structural steel lettings, which should be associated with an unusual volume of tearing down of old structures. Freight car retirements have been somewhat light, but the monthly scrap lists of the Pennsylvania Railroad have continued to run heavy. The automobile industry, which produces much scrap, made a new second-half record in production last year. And the scrap obtained from discarded cars (estimated at 3,000,000 tons last year) makes a huge total.

It is not adequate to say that the demand for scrap was exceptionally heavy, on account of the high rate of steel production, for in a general way the production of steel and the outcome of scrap are related to each other. Some years ago a sort of rule was worked out that rises in the scrap market presaged increasing steel production and vice versa. That involved two influences, mills making commitments further ahead and having to find extra scrap to make more steel, before there was time for their own works scrap to increase in volume. Lately steel production has been so steady as to give the rule little show.

Works scrap is really the main supply. Finished rolled steel production runs 73 to 74 per cent of steel ingot tonnage, and some additional scrap is produced, in pipe and wire manufacture in particular, before

the mill product is shipped. This scrap production is of both Bessemer and open-hearth, but the open-hearth gets practically all the scrap. From 1926 to 1928 Bessemer steel production decreased somewhat while open-hearth steel production increased materially, and that no doubt made some difference.

A study of scrap market records furnishes warning against any conclusion that the recent rise is a permanent affair. Before developing general theories of physical conditions, to explain the rise as a permanent institution, it would be well to make sure first that it is so. A glance at the composite scrap price table, page 129 of *THE IRON AGE* of Jan. 3, 1929, shows that the market has quite a tendency to reach a seasonal peak in January. Regularly there was less steel produced in the second half of a year than in the first half, while last year the second half ran ahead, which would give the market a particular support. In five successive years, according to the table, scrap has declined after January or February.

### The National Wealth

**I**N these days of inflationary stock values, extraordinary incomes, and huge accumulations in the portfolios of banks and insurance companies there are bound to be exaggerated ideas of our national wealth, its magnitude, rate of growth, division, etc.

We read that the quotational value of the securities listed on the New York Stock Exchange is upward of 100 billion dollars. An eminent statistician says there are between 30,000 and 40,000 millionaires in the country whose aggregate wealth is upward of 100 billion dollars. And so on.

Such remarks are interesting in a column of tit-bits, but they are devoid of any economic value, for besides the uncertainty regarding the accuracy of many of them there is no grand total with which to compare them. No complete estimate of the national wealth has ever been made; we doubt if it has ever been attempted.

In the first place the value of the stocks listed on the exchanges, and likewise of all forms of business, incorporated or unincorporated, that are not listed, is determined by what they will earn, and that is a variable according to changes in the rate of earning that is satisfying to investors. Of the gross value thus determined only a part is represented by physical property, the other part being a capitalization of experience, knowledge, patent rights, good will, organization, etc. No one knows how to make an enumeration and summary of such intangible wealth.

Efforts have been confined, therefore, to reckonings of our physical wealth. The Census, according to instructions from Congress, has been doing that decennially for a long time, with results not very satisfactory to anybody, itself included, although its last survey was much improved.

Dr. W. R. Ingalls, by an independent approach, estimated the value of the physical property in the United States at the end of 1920 at about 273 billion dollars on the basis of 1913 prices. We have already referred to the close agreement between this estimate and that made by the census for 1922, after allowing for certain inflationary valuations that were creeping in. About one-third of the national wealth at that time was in the hands of the farmers. Another third was in urban

lands and buildings. Rather less than one-fifth was in the railroads, factories, public utilities and mines.

In 1920 we were less than half as far away from 1913 as we are now. Since 1920, even previously, our national income has been reckoned upon an inflationary basis, incorporating in recent years an index of general price level of about 1.8, and the savings out of income so computed have gone into buildings and other things on a similar basis. We might, therefore, assume the national physical wealth at the end of 1920 to be 300 billion of 1913 dollars or 540 billion current dollars; and at the end of 1928 the same, plus annual increments out of savings, less a certain deduction for losses. We are not pursuing this figuring any further, for of course it is wrong. The value of urban real estate has indeed been written up in some such way; but not so with the value of rural property. Nor has the value of the steam railroads been written up, although their managers argue that it ought to be, while the Interstate Commerce Commission refuses to allow it. Other public utilities are in a similar position.

We may safely say, however, that if the value of American physical wealth at the end of 1920 was 300 billion dollars of 1913, its value in current dollars at the end of 1928 was certainly less than 600 and more than 400, and probably nearer the lower figure than the higher, which is a generalization so broad as to be immune from criticism, even if it be not very illuminating. It may well be remarked, however, that such totals are the result of writing up rather than of material progress, for during the last eight years we can hardly have saved out of our annual income any more than 60 billions in current dollars, against which we have had losses by fire, flood, and other accidents, besides natural deterioration and obsolescence.

Another item in our national wealth is, of course, our foreign investments, or external wealth, which constitutes a substantial item, although in proportion to our internal wealth it is still relatively small.

Obviously not even will this bold figuring reconcile itself with the quotational value of the stocks of our corporations, which is certainly more than 100 billion dollars and perhaps as much as 200 billions, although it is positive that the corporations do not possess physical property to any such extent. The difference is explainable in part under the head of intangible wealth, which we have no good way of figuring; and in part perhaps by over-valuation. The great rise in the quotational value of stocks that occurred in 1928 alone *ipso facto* associates itself with a considerable degree of over-valuation. If, as Colonel Ayres says, many stocks have discounted in present price their expected earning capacity four or five years hence, that is, of course, a present over-valuation.

### Eighteen-Cent Copper

**I**N the closing months of last year an extended buying movement brought the price of copper up to 16 cents. Visible stocks were low, and buyers both here and abroad were nervously wondering whether their supplies under roof and contract would suffice for their full order books. The situation was one which demanded restraint on the part of both sellers and buyers of refined copper. Unfortunately the latter have let their fears get the better of their caution, and proceeded to bid up the price to 18 cents.

How much higher it will go depends upon how soon the brass and copper mills come out of a buying scramble and get their feet back solidly on the ground. As was said editorially in *THE IRON AGE*, Dec. 27 last, there is no need for such fancy prices. Sixteen cents is ample to bring prosperity to the copper producers. Since it takes three months for new copper to get from the underground workings to the refinery shipping platform, expansion cannot follow a soaring price immediately, even though idle capacity exists. Nor is it any more necessary to have a big inventory of 18-cent copper now than it was in 1927, when hand-to-mouth buying of 13-cent metal met the situation. Finally, a runaway market is bad for business; each advance limits the amount of finished products which can be sold.

To quote from what we said seven weeks ago:

## CORRESPONDENCE

### Compares Automatic and Pilger Tube Processes

*To the Editor:* The paper of R. C. Stiefel and G. A. Pugh, comparing the automatic process with the pilger tube process (*THE IRON AGE*, May 24, 1928, pages 1466-9) has received close attention in Germany. The contentions of Stiefel cannot be wholly accepted, and so in the following I would go into a comparison of the two processes.

In making a comparison it is necessary to take as the basis the same diameter of tube, the same wall thickness, the number of rolled feet, etc. The number of rolled tubes need not be considered, the automatic mill producing tubes only up to 40 ft. in length and the pilger mill up to 100 ft. and more. Even the small tubes of 2½ in. diameter have, with the pilger mill, lengths up to 40 ft. and with the plug mill only 20 to 23 ft.

Then the wall thickness of pilgered tubes is mostly thinner than that of the tubes obtained with the plug mill process. Hence one must pay attention to the following:

1. According to Stiefel with a plug mill plant for tubes of 5 in. diameter and larger, the production was 200,000 tons a year, that is, 28 tons per hour with three 8-hr. shifts. (No upper limit of the diameter being given, tubes of 8 in. diameter shall be taken as the average).

2. The greatest daily output of a plug mill plant was about the middle of 1927, or in three 8-hr. shifts, 1950 tubes, equal to 925 tons of 8-in. outside diameter pipe of 25/64-in. wall thickness and 33 ft. in length.

3. A pilger mill plant for tubes of 6 to 12 in. outside diameter was arranged for a daily output of 150 tons in 10 hr. and 200 to 250 tons of tubes of 7½ to 8½-in. O. D. and 5/16-in. wall thickness was produced in 10 hr.

When rolling tubes of 8 in. outside diameter the following output has been obtained:

1. With plug mill (case I), about 28 tons per hr. = 200,000 tons per year.
2. With plug mill (case II), about 38.5 tons per hr. = 275,000 tons per year.
3. With pilger mill, about 22 tons per hr. = 160,000 tons per year.

The output per hour in tons of the first plug mill is only about 27 per cent and that of the second plug mill, working under favorable conditions, only about 75 per cent greater than that of the pilger mill. With the same wall thickness, the difference in capacity is less marked.

Most favorable for pilger mill is the comparison of

"These considerations, viz., that no one wants a fluctuating market, that expansion in production must be gradual, that there is no possibility of a famine, and that the present price is ample, all urge the necessity of calm and considered action in the copper market."

THREE January records of importance were broken last month. In pig iron, the daily output last month at 111,044 gross tons was the largest for any January to date. It surpassed January a year ago by close to 20 per cent. In steel ingots last month was the highest January in daily as well as monthly figures. Automobile production last month is estimated at 400,000 cars and trucks, or the highest January in automobile history. The year is certainly getting an auspicious start.

output in feet; for example, for tubes of 8 in. outside diameter:

1. Plug mill (I), 25/64 in. wall thickness, about 1945 ft. per hour = 59 tubes of about 33 ft. length.
2. Plug mill (II), 25/64 in. wall thickness, about 2800 ft. per hour = 85 tubes of about 33 ft. length.
3. Pilger mill, 5/16 in. wall thickness, about 1900 ft. per hour = 19 tubes of about 100 ft. length.

The plug mill (I) produces per hour only 45 ft. more than the pilger mill, and case II of the plug mill, 900 ft., or about 50 per cent more. The plug mill will not obtain the mentioned output at a wall thickness of 5/16 in., so that when rolling that wall thickness the proportion is more favorable for the pilger mill than mentioned. In Germany tubes of 8 in. O. D. are pilgered with a still thinner wall, viz., 7/32 and ¼ in.

Stiefel is absolutely right when calling attention to the fact that the extremity of the pierced billet has become too cold at the end of rolling when rolling lasts 8 min. for a tube of 100 ft. length. This is no reproach to the pilger process, for according to my experience a tube of 100 ft. length and 8 in. O. D. can be pilgered in 2½ to 3 instead of 8 min., and so the pilger mill, working precisely, can obtain at least double the output.

Also with tubes of 2 to 5 in. O. D., the pilger mill is more favorable than plug mill. It is not correct to compare a modern plug mill with two housings and highest output (for instance 300 tubes, or 6400 ft. per hour, 2½ in. O. D., ½-in. wall thickness, 20 to 23 ft. length) with a not-fully utilized and old pilger mill.

Two years ago a pilger mill with four housings produced 140 tubes of 2½ in. O. D., 7/64 in. (or 3/32 in. = 2½ mm.) wall thickness, 33 ft. long, or 4600 ft. per hour. This is not the highest capacity for a pilger rolling mill. I do not consider as too high an output of 6600 ft. per hour, with four housings.

More essential than the matter of outputs is the comparison of the costs of manufacture. Stiefel as well as Wharton have mentioned that the plug mill process needs a particularly good steel, the piercing mill being forced to pierce to a much thinner wall than with pilger process. The provision of rolled billets of necessary quality makes for difficulties in Europe for new plug mill plants.

In changing production of the pilger mill from one size of tube to another, no long time is lost. The changing of pilger rolls can be made in the case of a small pilger mill in half an hour.

The pilgered tubes do not need to be smoothed. The pilger-humps caused by pilgering are removed by calibrating the reheated tubes in the calibrating mill, or the warm-draw bench. On the other hand, the tubes leaving the plug mill must be smoothed in the reeling or

polishing mill, because of the grooves in the inside surface, and then calibrated in the sizing mill. Indeed, small water tubes with 3/32 in. wall thickness are finished in the pilger mill, while they are rolled with the plug mill with 1/2 in. wall thickness and then must be finished by cold drawing to 3/32 in. (2 1/2 mm.) wall thickness. This cold drawing increases the costs of manufacture of the small water tubes produced on the plug mill.

In conclusion, comparisons may be made of the selling prices. Tubes being sold according to weight, the pilgered tube with 5/16-in. wall thickness is cheaper for the buyer than the tube with 25/64 in. wall thickness. Tubes with 7/32 or 1/4-in. wall thickness sufficing in most cases, the buyer would naturally prefer the cheaper tube of smaller weight. The pilgered tube has all the advantage.

The expanding mill was formerly used by the Mannesmann Tube Works for expanding pilgered tubes from about 6 in. to 12 in. outside diameter, but later it was replaced by a larger pilger mill. Rolling tubes of 14 1/2 in. O. D. and larger with the plug mill is difficult, and therefore the expanding mill may be a welcome supplement. But it must be said that tubes are expanded just as by piercing in the oblique rolls, and by 70 per cent, if expanding is from 14 in. to 24 in. O. D. Therefore billets of a particularly good quality are necessary for this plug mill and expanding process.

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## Breaks Ground for Aston Process Plant

### Secretary of Labor Davis Officiates for A. M. Byers Co. at Site of New Wrought Iron Pipe Works

PITTSBURGH, Feb. 12.—The requiem of the iron puddler has been sung if the Aston process of making wrought iron comes into universal use, declared Secretary of Labor James J. Davis in an address yesterday at the ground-breaking ceremonies on the site of the proposed plant of A. M. Byers Co. at Ambridge, Pa., where it will manufacture wrought iron pipe by that process. But at the same time, said Secretary Davis, himself a former iron puddler, it lifts a load off the back of the puddler and wipes the sweat from his brow.

Paying a tribute to the good puddler as "the unshackled workman of his day, loving his independence," Secretary Davis said that for at least a hundred years efforts have been made to invent a mechanism to take the place of the human being in front of the puddling furnace. Heretofore, he stated, the effort has been to create a machine that would imitate the movements of a human worker. All such efforts failed, Secretary Davis explained. Now, it was pointed out, the metallurgist has stepped in and has probably brought success. He has known better than to try making a machine take the place of a man, Secretary of Labor Davis said.

"Instead of a machine he has invented a process. And where the machine always failed, the process works.

"The part of it which has convinced me of its success is the dropping of the old idea of the 'heat' and substituting a ball of iron weighing 2500 to 3000 lb. weight, and making this in a short time. The stuff I saw come through the process has the look of real iron, and it met the test of puddled iron.

"But as the human puddler has been replaced by this new process, so the old squeezer has given way to the new compressor. The old squeezer would never have been able to swallow a 3000-lb. ball of iron. This great mass of iron that comes out of the process, the compressor handles like a pill, and presses it out into a bloom

and then rolls it out in a tandem mill.

"When I saw that I knew that not only was the old human puddler gone from the making of iron. The muck rolls worker had gone with him.

"There is a saving, too, because, under the old method, in the production of 2500 to 3000 weight of iron, with two crop ends to the mill, three balls to the heat, and five heats a day, there were 30 crop ends, but with this new process there are but two crop ends to the same weight. And while it formerly required a day's labor to produce this weight of iron, it can now be produced in a half hour."

Taking up the effect of mechanized industry on labor, Secretary Davis de-

clared that the new process will mean increased production and the giving of employment to more men, cheapening the cost of iron so that more of it can be sold and used, and perhaps opening new industries for the working of iron into new products, with still further extension of new jobs to new men.

"But, above all, with this lightening of the work in the making of iron, there is opportunity to continue in employment the older man," said Secretary Davis. "I know of no one in the (Byers) mill at Girard (Ohio) who could not take one of these new process jobs. Here is where Byers & Co. can set an example by keeping on their old employees instead of recruiting new workers and putting them into this process." He strongly urged a policy of retaining old employees, and condemned the idea that men are not capable of doing efficient work in a mill after they are 50 years old.

## Pittsburgh Bolt and Nut Companies Merged

The Pittsburgh Screw & Bolt Corporation has acquired the Graham Bolt & Nut Co., also of Pittsburgh, in which the Jones & Laughlin Steel Corporation has had a controlling interest for the past five years. Coincident with the consummation of this deal, William G. Costin, chairman of the former, announced the organization of a new company to be known as the Pittsburgh Screw & Bolt Co., to take over the Pittsburgh Screw & Bolt Corporation, the Colona Mfg. Co., which has been controlled by Mr. Costin and his associates, and the patent rights to new types of airplane propellers and hubs. The new company will rank high as a producer of bolts, nuts and rivets, since, in addition to the Pittsburgh Screw & Bolt Corporation plant on Preble Avenue, Pittsburgh, N. S., and the Graham plant on Neville Island, in the Ohio River near Pittsburgh, it has large capacity in the Chicago district in the Gary Screw & Bolt Co., Gary, Ind., which, a few years ago, absorbed another Chicago district bolt and nut company. The Colona Mfg. Co., whose plant is at Colona, Pa., is engaged in the manufacture of pipe

thread protectors and couplings.

The new company will have an authorized capitalization of 2,000,000 shares of no-par value stock, of which 1,482,771 shares will be presently outstanding. For each share of Pittsburgh Screw & Bolt Corporation stock, 3% shares of stock in the new company will be given and 1 1/2 shares of the new stock is to be given in exchange for each share of Colona Mfg. Co. stock. To provide cash, 73,500 shares of the new company are to be sold to the public. Stock also is to be given for the Graham company and for the patent rights on the new airplane propeller, but the official announcement does not provide information as to the distribution.

William G. Costin will be chairman of the new company, Charles R. Ferguson, who has been president of the Pittsburgh Screw & Bolt Corporation, president, and the board of directors will include Henry Lockhart, Jr., Taylor Allderice, former president National Tube Co., Van Lear P. Shriver and John A. Dillon. John P. Hoelzel, George H. Lee, Howard Keally, John M. Yahres, and Frank B. Gordon of the Screw & Bolt corporation, and Charles J. Graham and H. C. Graham of the Graham company, will be vice-presidents, and J. M. Auty, secretary.

# Iron and Steel Markets

## Pressure on Mills Unabated

Steel Output Sustained After Record January—Automotive  
Demands Mounting—Advance in Hot Strip—  
Scrap Steadier, Coke Higher

**P**RODUCTION is sustained, following January records in both pig iron and steel output, and prices of rolled steel are gaining in strength.

Mill operations find their main support in the demands of the automobile industry and the railroads. Motor car output last month was the largest for any January and is still expanding. Freight cars ordered during the week numbered 4300, making a total of more than 22,000 bought since Jan. 1.

Heavier specifications are also coming from the farm equipment industry, which is placing into operation recently added manufacturing capacity. The excellent prospects in the canning industry are reflected in tin plate output, which continues at a 90 per cent rate.

Last month's production of steel ingots, calculated at 4,489,391 gross tons, was not only the greatest for any January, but was the fourth largest monthly total on record, having been exceeded only by October and March, 1928, and March, 1927. In view of such a high rate of output, the Steel Corporation's gain in unfilled tonnage in January—132,775 tons—is impressive.

Mill activity thus far in February has shown no signs of letting up. Ingot production at Chicago remains at 92 per cent of capacity, while output at Pittsburgh is estimated at 85 per cent and in the Youngstown and Wheeling districts at 90 per cent.

The price situation, although not without irregularities, appears to be hardening. The decline in scrap prices has been halted, heavy melting steel at Pittsburgh remaining unchanged at \$18.75 a ton, after having receded \$1 a ton in the preceding fortnight. Furnace coke at Connellsville has advanced 10c. a ton to \$2.85, partly because of extra demands from steel companies but mainly on account of severe weather in the Central West, which has created a larger market for domestic fuel than by-product ovens are able to satisfy.

Pig iron prices are largely untested, in view of a lack of interest in second quarter requirements except at Chicago and Cleveland, where the growing needs of automotive foundries are felt.

The finished steel market is strongest in products used by motor car builders. Makers of hot-rolled strip have advanced prices \$2 a ton to 1.90c. a lb., Pittsburgh, for wide sizes and 2c. for narrow material. Chicago base prices have been raised proportionately.

The advance in hot strip has prompted a producer of blue annealed sheets to take similar action, and a \$2 a ton increase in quotations is also contemplated

for black and galvanized, despite recent weakness in both of those finishes, particularly the latter. No price change is expected in automobile body sheets. Most mills making sheets for the motor car industry have specifications to keep them running full for the rest of the quarter.

Plates show strength at Chicago, where the requirements of a maker of electrically welded pipe have been added to the demands of railroad car builders and tank fabricators. Plates for a pipe line, placed during the week, total 25,000 tons. In other districts both plates and shapes have been irregular. In the determination to swell bookings late last year, some producers shaded prices to secure the large tonnages then offered. The present prospect is for higher realized prices for the second quarter, through stricter adherence to present quotations rather than through an advance.

The tendency to make concessions on track supplies, especially tie plates and track spikes, has not yet disappeared.

Fabricated structural steel awards, at 18,000 tons, were the smallest since the first of the year, but the list of pending projects was swelled by inquiries for 33,000 tons, of which 10,000 tons is for a railroad office building at Philadelphia.

Machine tool demand continues to mount, with business coming from nearly all industries and with orders from motor car builders conspicuously large. Deliveries have become a major problem, ranging from six to ten weeks and in extreme instances extending through the first half of the year. A feature of the market is a revival of buying in New England, where manufacturers of textile machinery are placing orders for shop equipment for the first time in a number of years.

Copper has registered further advances, reaching 18c. a lb., delivered Connecticut Valley, the highest price for electrolytic metal since 1920. Accompanying the rise in domestic prices were two advances by Copper Exporters, Inc., lifting the market to 18¼c., c.i.f. European ports.

Pig iron prices in Great Britain, according to our London cable, have advanced 6d. to 1s. (12 to 24c.) a ton, reflecting a scarcity of supplies and an unwillingness to light additional furnaces.

Both of THE IRON AGE composite prices are unchanged, that for pig iron at \$18.38 a ton and that for finished steel at 2.391c. a lb.

# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Feb. 11, 1929	Feb. 5, 1929	Jan. 15, 1929	Feb. 14, 1928
No. 2 foundry, Philadelphia...	\$21.26	\$21.26	\$21.26	\$20.76
No. 2, Valley furnace.....	17.50	17.50	17.50	17.25
No. 2, Southern, Cin'tl.....	20.19	20.19	20.19	19.69
No. 2, Birmingham.....	16.50	16.50	16.50	16.00
No. 2 foundry, Chicago*.....	20.00	20.00	20.00	18.50
Basic, del'd eastern Pa.....	19.75	19.75	19.75	19.50
Basic, Valley furnace.....	17.50	17.50	17.50	17.00
Valley Bessemer, del'd P'gh..	20.01	20.01	20.01	19.26
Malleable, Chicago*.....	20.00	20.00	20.00	18.50
Malleable, Valley.....	18.00	18.00	18.00	17.25
Gray forge, Pittsburgh.....	18.76	18.76	18.76	18.51
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace....	105.00	105.00	105.00	100.00

Rails, Billets, Etc., Per Gross Ton:	Feb. 11, 1929	Feb. 5, 1929	Jan. 15, 1929	Feb. 14, 1928
O.-h. rails, heavy, at mill....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh.....	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh.....	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh.....	34.00	34.00	34.00	34.00
Forging billets, P'gh.....	38.00	38.00	38.00	38.00
O.-h. billets, Phila.....	38.30	38.30	38.30	38.30
Wire rods, Pittsburgh.....	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.90	1.90	1.90	1.85

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia.....	2.12	2.12	2.12	2.12
Iron bars, Chicago.....	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh.....	1.90	1.90	1.90	1.85
Steel bars, Chicago.....	2.00	2.00	2.00	1.95
Steel bars, New York.....	2.24	2.24	2.24	2.19
Tank plates, Pittsburgh.....	1.90	1.90	1.90	1.85
Tank plates, Chicago.....	2.00	2.00	2.00	1.95
Tank plates, New York.....	2.17½	2.17½	2.17½	2.17½
Beams, Pittsburgh.....	1.90	1.90	1.90	1.85
Beams, Chicago.....	2.00	2.00	2.00	1.95
Beams, New York.....	2.14½	2.14½	2.14½	2.14½
Steel hoops, Pittsburgh.....	2.10	2.10	2.10	2.20

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Feb. 11, 1929	Feb. 5, 1929	Jan. 15, 1929	Feb. 14, 1928
	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh...	2.85	2.85	2.85	2.90
Sheets, black, No. 24, Chicago				
dist. mill.....	2.95	2.95	2.95	3.00
Sheets, galv., No. 24, P'gh...	3.60	3.60	3.60	3.65
Sheets, galv. No. 24, Chicago				
dist. mill.....	3.70	3.70	3.70	3.85
Sheets, blue, 9 and 10, P'gh..	2.10	2.10	2.10	2.10
Sheets, blue, 9 and 10, Chicago				
dist. mill.....	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh.....	2.65	2.65	2.65	2.65
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.70
Plain wire, Pittsburgh.....	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.55
Barbed wire, galv., P'gh.....	3.30	3.30	3.30	3.35
Barbed wire, galv., Chicago				
dist. mill.....	3.35	3.35	3.35	3.40
Tin plate, 100 lb. box, P'gh...	\$5.35	\$5.35	\$5.35	\$5.25

Old Material, Per Gross Ton:	Feb. 11, 1929	Feb. 5, 1929	Jan. 15, 1929	Feb. 14, 1928
Heavy melting steel, P'gh....	\$18.75	\$18.75	\$19.25	\$15.00
Heavy melting steel, Phila....	16.50	16.50	16.00	13.50
Heavy melting steel, Ch'go....	16.00	16.00	14.75	12.50
Carwheels, Chicago.....	14.50	14.50	14.00	14.00
Carwheels, Philadelphia.....	16.50	16.50	16.50	15.50
No. 1 cast, Pittsburgh.....	15.00	15.00	16.00	14.50
No. 1 cast, Philadelphia.....	16.50	16.50	16.25	16.00
No. 1 cast, Ch'go (net ton)...	16.50	16.50	15.75	14.50
No. 1 RR. wrot., Phila.....	16.00	16.00	15.50	15.00
No. 1 RR. wrot., Ch'go (net)...	14.50	14.50	13.25	11.00

Coke, Connellsville, Per Net Ton at Oven:	Feb. 11, 1929	Feb. 5, 1929	Jan. 15, 1929	Feb. 14, 1928
Furnace coke, prompt.....	\$2.85	\$2.75	\$2.75	\$2.75
Foundry coke, prompt.....	3.75	3.75	3.75	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	18.12½	17.62½	16.87½	14.25
Electrolytic copper, refinery..	17.75	17.25	16.50	13.87½
Zinc, St. Louis.....	6.35	6.35	6.35	5.60
Zinc, New York.....	6.70	6.70	6.70	5.95
Lead, St. Louis.....	6.62½	6.50	6.50	6.12½
Lead, New York.....	6.85	6.65	6.65	6.35
Tin (Straits), New York.....	49.75	50.37½	49.00	51.87½
Antimony (Asiatic), N. Y....	9.62½	9.75	9.50	11.00

## Pittsburgh

### Automotive Demands Tax Bar, Sheet and Strip Mills— Hot-Rolled Strip Up \$2—Sheets to Be Advanced

PITTSBURGH, Feb. 11.—The steel market is featured by extreme activity in steels finding use in automobile production. This outlet, with rails and tin plate, provides the principal prop to sustained steel works operations of 85 per cent of capacity in this district and of fully 90 per cent in the Youngstown and Wheeling districts. Typical of the demand from the motor car builders is the condition of one local strip maker having a schedule of full operation of two tonnage mills for three weeks, with the specifications all calling for shipment in a week or 10 days. In sheets, it is the requirements of the automotive industry that account for almost full physical capacity operation of the mills, as the movement of the common finishes leaves something to be desired. The fact that reports of concessions in black and galvanized sheets again are being heard is explained by a lack of backlogs among several makers.

General demand for steel bars is good, but real activity is seen in the demand from those serving the automotive industry. There are few makers of tin plate who have not sufficient business to maintain 90 per cent engagement of mill capacity. Rail mills also are running at a high rate. In pipe, the chief activity is in seamless oil country goods and tubing for boiler and automobile use. Wire products are quieter after the heavy

shipments of January, which seem to have filled up distributors for the present, the spring demand not yet having started.

Aside from the recurrence of price shading in the common finishes of sheets, price developments of the week have been generally in the other direction. A general advance on hot-rolled strips of \$2 a ton has been announced. In face of the fact that some trouble has been experienced in holding prices

of black and galvanized sheets, some makers may advance prices of those grades \$2 a ton, this apparently being an effort to eliminate the preferential price treatment to jobbers in the case of galvanized sheets. Such preference was to have been ended as of Jan. 1, but seemingly too much tonnage was carried over from last year to bring it about. There is something of a shortage of semi-finished steel because of the urgency and size of the demand for sheets and strips, and it would occasion no surprise if higher prices were announced on second quarter tonnages.

The scrap market, as it relates to steel works grades, is a two-sided affair and, while prices are off \$1 a ton from the recent peak, weakness is more apparent than real. The Pennsylvania Railroad got as much for the heavy melting steel in its February scrap list as it did in January. Because there is so much direct buying of scrap by melters, dealers hesitate about taking orders for prompt shipment at less than \$19, fearing difficulty in getting sufficient supplies. There has been no decrease in steel works operations and, while more pig iron than previously is being used, it

is doubtful if the supply of No. 1 railroad steel, which most steel makers want, is more plentiful now than it was a month ago.

New business in pig iron remains very light. Furnace coke has strengthened, partly because of extra demands from steel companies occasioned by the need of speeding up production of iron, but chiefly because of the wide market for household coke, which cannot be fully supplied from by-product ovens.

**Pig Iron.**—Consumers still are filling their needs from shipments on old orders, and new business consequently is limited. Not a few producers are shipping more than they are making, and this fact, coupled with a general disposition to regard present prices as too low, restrains selling pressure. Prices are fairly firm. The largest inquiry before the market is that of the National Radiator Corporation, which has asked for prices on its second quarter requirements for plants at Johnstown and New Castle, Pa., and Trenton, N. J. Valley furnaces are interested chiefly in the iron for the New Castle plant, which ordinarily takes 500 tons a month.

Prices per gross ton, f.o.b. Valley furnace:  
Basic .....\$17.50  
Bessemer ..... 18.25  
Gray forge ..... 17.00  
No. 2 foundry ..... 17.50  
No. 3 foundry ..... 17.00  
Malleable ..... 18.00  
Low phos., copper free.....\$26.50 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

**Semi-Finished Steel.**—No abatement of sheet and strip mill activity having occurred, specifications for billets, slabs and sheet bars remain very heavy and producers have no surplus over their own requirements and those of their contract customers. It is probable that an advance would be asked from buyers who might need extra tonnages and wanted them shipped promptly. Few such cases have developed, however, and the tonnage moved at premium prices has been hardly large enough to be recognized as definitely establishing the market on a higher basis. Second quarter prices will depend upon whether the present pressure for strips and automobile body sheets continues strong enough to sustain higher prices just announced in hot-rolled strips and the

## Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes...	2.90c.
Reinforcing steel bars.....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands .....	3.25c.
Hoops .....	4.25c.
Black sheets (No. 24), 25 or more bundles .....	3.80c.
Galv. sheets (No. 24), 25 or more bundles .....	4.55c.
Blue ann'd sheets (No. 10), 1 to 10 sheets .....	3.45c.
Galv. corrug. sheets (No. 28), per square .....	\$4.43
Spikes, large .....	3.40c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb. \$3.50	
Wire, black soft ann'd, base per 100 lb. \$3.00 to 3.10	
Wire, galv. soft, base per 100 lb. 3.00 to 3.10	
Common wire nails, per keg 3.00	
Cement coated nails, per keg 3.05	

present sheet prices, which are \$2 a ton above those at which buyers have been getting supplies in the past month. Wire rods are firm at \$42, base Pittsburgh or Cleveland, and are moving well.

**Bars.**—Specifications are heavy, particularly on the sizes and shapes finding ultimate use in automobile construction. Jobbers are fairly heavy buyers of merchant bars in replacing shipments from their stocks in January. Demand for reinforcing bars reflects the seasonal lack of reinforced concrete work. The general price for steel bars still is 1.90c., base Pittsburgh. Iron bars still range from 2.75c. to 4.25c., base Pittsburgh.

**Structural Shapes.**—Strictly new business reflects the moderate lettings of fabricated steel in this district and the light bookings by local shops in other districts. A good movement of shapes on old contracts, therefore, is at the expense of mill order books. The ruling price still is 1.90c., base Pittsburgh.

**Plates.**—Business is only moderately active with mills in this district, but there is a hope that the heavily

committed condition of Chicago district mills will bring business here that otherwise would go to central western producers. The Norfolk & Western has deferred until later this month the closing on the steel for 1000 57½-ton bodies. Barge business is taking a fair tonnage of plates, but no large line pipe orders have lately come to local mills. The market still is quotable at 1.90c., base Pittsburgh, without much regard to the size of the order.

**Rails and Track Supplies.**—The Boston & Maine Railroad will close Feb. 13 on 300,000 tie plates. Makers generally are well supplied with orders for spikes, tie plates and track bolts, and specifications are as heavy as they ever are at this time of the year. Standard-section rails are moving well, but there is only a limited call for light-section rails.

**Wire Products.**—New business still waits on a heavier movement into consumption. While consuming demand for nails, wire and fence has lately shown some increase, it has not taxed supplies in second hands to a point where fresh purchases of size are necessary. The new price schedule, therefore, has not been seriously tested, but mills are encouraged to expect acceptance by distributors in view of the fact that the latter are holding well to the resale prices based upon the new mill schedules.

**Tubular Goods.**—Movement of seamless pipe continues large and there is a steady expansion in the demand for butt-welded pipe as jobbers make ready for spring building and construction demands. The latter are good in those parts of the country where weather conditions are favorable to outdoor work. Producers are still waiting for the inquiry for the 475 miles of 22-in. pipe for the gas line of the Mississippi Fuel Corporation to run from Monroe, La., to St. Louis. Tubing still is going out freely, notably to the motor car builders.

**Cold-Finished Steel Bars.**—While there is some unevenness in the demand from automobile parts makers, reflecting the fact that some motor car builders are not doing as well as others, the total movement of cold-finished steel bars is satisfactory and

## THE IRON AGE Composite Prices

### Finished Steel

Feb. 11, 1929, 2.391c. a Lb.

One week ago.....	2.391c.
One month ago.....	2.391c.
One year ago.....	2.364c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, wire, nails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.391c., Dec. 11:	2.314c., Jan. 3		
1927	2.453c., Jan. 4:	2.293c., Oct. 25		
1926	2.453c., Jan. 5:	2.403c., May 18		
1925	2.560c., Jan. 6:	2.396c., Aug. 18		
1924	2.789c., Jan. 15:	2.460c., Oct. 14		
1923	2.824c., Apr. 24:	2.446c., Jan. 2		

### Pig Iron

Feb. 11, 1929, \$18.38 a Gross Ton

One week ago.....	\$18.38
One month ago.....	18.46
One year ago.....	17.75
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	\$18.59, Nov. 27:	\$17.04, July 24		
1927	19.71, Jan. 4:	17.54, Nov. 1		
1926	21.54, Jan. 5:	19.46, July 13		
1925	22.50, Jan. 13:	18.96, July 7		
1924	22.88, Feb. 26:	19.21, Nov. 3		
1923	30.86, Mar. 20:	20.77, Nov. 20		

# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
Del'd Philadelphia.....	2.22c.
Del'd New York.....	2.24c.
Del'd Cleveland.....	1.92½c. to 1.95c.
F.o.b. Cleveland.....	1.90c. to 1.95c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
C.I.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.....	2.00c.
F.o.b. Pittsburgh mills, cut lengths.....	2.25c.
F.o.b. Birmingham, mill lengths.....	2.15c.

### Rail Steel

F.o.b. mills east of Chicago dist.....	1.85c.
F.o.b. Chicago Heights mill.....	1.95c.

### Iron

Common iron, f.o.b. Chicago.....	2.00c. to 2.10c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

## Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.10c. to 2.20c.
F.o.b. Coatesville.....	2.00c. to 2.10c.
F.o.b. Sparrows Point.....	2.00c. to 2.10c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
Del'd New York.....	2.17½c. to 2.27½c.
C.I.f. Pacific ports.....	2.20c. to 2.30c.

## Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
F.o.b. Bethlehem.....	2.00c. to 2.10c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.06c. to 2.16c.
Del'd New York.....	2.14½c. to 2.24½c.
C.I.f. Pacific ports.....	2.35c.

## Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh.....	1.90c. to 2.00c.
Wider than 6 in., P'gh.....	1.80c. to 1.90c.
6 in. and narrower, Chicago.....	2.10c. to 2.20c.
Wider than 6 in., Chicago.....	2.00c. to 2.10c.
Cooperage stock, P'gh.....	2.10c. to 2.20c.
Cooperage stock, Chicago.....	2.20c. to 2.30c.

## Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.20c.
Bars, f.o.b. Chicago.....	2.20c.
Bars, Cleveland.....	2.25c.
Shafting, ground, f.o.b. mill.....	*2.55c. to 3.50c.
Strips, P'gh.....	2.85c. to 2.95c.
Strips, Cleveland.....	2.85c. to 2.95c.
Strips, del'd Chicago.....	3.15c. to 3.25c.
Strips, Worcester.....	3.00c. to 3.10c.
Fender stock, No. 20 gage, Pitts-	
burgh or Cleveland.....	4.25c. to 4.35c.

\*According to size.

## Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails.....	\$2.65 to \$2.75
Galvanized nails.....	4.65 to 4.75
Galvanized staples.....	3.35 to 3.45
Polished staples.....	3.10 to 3.20
Cement coated nails.....	2.65 to 2.75

	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9	
gauge.....	\$2.50 to \$2.60
Annealed fence wire.....	2.65 to 2.75
Spring wire.....	3.50 to 3.60
Galv'd wire, No. 9.....	3.10 to 3.20
Barbed wire, galv'd.....	3.30 to 3.40
Barbed wire, painted.....	3.05 to 3.15
Woven wire fence (per net ton to	
retailers).....	65.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester Mass., (wire) mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

## Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or North-	
umberland, Pa.....	\$2.70
Less carloads, Wheeling or Reading.....	2.80

## Sheets

### Blue Annealed

	Base per Lb.
Nos. 9 and 10, f.o.b. P'gh.....	2.10c.
Nos. 9 and 10, f.o.b. Chicago dist.....	2.20c.
Nos. 9 and 10, del'd Cleveland.....	2.29c.
Nos. 9 and 10, del'd Philadelphia.....	2.42c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.25c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.85c.
No. 24, f.o.b. Chicago dist. mill.....	2.95c.
No. 24, del'd Cleveland.....	3.04c.
No. 24, del'd Philadelphia.....	3.17c.
No. 24, f.o.b. Birmingham.....	3.00c.

### Metal Furniture Sheets

No. 24, f.o.b. P'gh, No. 1 grade.....	4.00c.
No. 24, f.o.b. P'gh, No. 2 grade.....	3.80c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.60c.
No. 24, f.o.b. Chicago dist. mill.....	3.70c.
No. 24, del'd Cleveland.....	3.79c.
No. 24, del'd Philadelphia.....	3.92c.
No. 24, f.o.b. Birmingham.....	3.75c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.00c.
No. 28, f.o.b. Chicago dist. mill.....	3.10c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.10c.
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### Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.00c.
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### Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh.....	3.90c.
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## Tin Plate

Standard cokes, f.o.b. P'gh district mills.....\$5.35

Standard cokes, f.o.b. Gary.....5.45

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.\$11.20 (25-lb. coating I.C.\$16.70

15-lb. coating I.C. 14.00 (30-lb. coating I.C. 17.75

20-lb. coating I.C. 15.30 (40-lb. coating I.C. 19.85

## Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series

Numbers

2000 (½% Nickel).....\$0.25

2100 (1½% Nickel).....0.55

2300 (3½% Nickel).....1.50

2500 (5% Nickel).....2.25

3100 Nickel Chromium.....0.55

3200 Nickel Chromium.....1.35

3300 Nickel Chromium.....3.80

3400 Nickel Chromium.....3.20

4100 Chromium Molybdenum (0.15 to

0.25 Molybdenum).....0.50

4100 Chromium Molybdenum (0.25 to

0.40 Molybdenum).....0.70

4600 Nickel Molybdenum (0.20 to 0.30

Molybdenum, 1.25 to 1.75 Nickel)

5100 Chromium Steel (0.60 to 0.90

Chromium).....0.35

5100 Chromium Steel (0.80 to 1.10

Chromium).....0.45

5100 Chromium Spring Steel.....0.20

6100 Chromium Vanadium Bars.....1.20

6100 Chromium Vanadium Spring Steel

9250 Silicon Manganese Spring Steel

(flats).....0.25

Rounds and squares.....0.50

Chromium Nickel Vanadium.....1.50

Carbon Vanadium.....0.95

Above prices are for hot-rolled steel bars,

forging quality. The ordinary differential for

cold-drawn bars is ¼c. per lb. higher. For bil-

lets 4 x 4 to 10 x 10 in., the price for a gross

ton is the net price for bars of the same anal-

ysis. For billets under 4 x 4 down to and in-

cluding 2½ in. squares, the price is \$5 a gross

ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over

carry the billet price; slabs with sectional area

of 12 in. to 16 in. carry a \$5 extra above the

billet price and slabs with a sectional area

under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

## Rails

Standard, f.o.b. mill.....\$43.00

Light (from billets), f.o.b. mill.....36.00

Light (from rail steel), f.o.b. mill.....34.00

Light (from billets), f.o.b. Ch'go mill.....36.00

## Track Equipment

Base per 100 Lb.

Spikes, 9/16 in. and larger.....\$2.80

Spikes, ½ in. and smaller.....2.80

Spikes, boat and barge.....3.00

Tie plates, steel.....2.15

Angle bars.....\$2.75

Track bolts, to steam railroads.....\$3.80 to 4.00

Track bolts, to jobbers, all sizes, per 100

count.....70 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District

and Lorain, Ohio, Mills

### Butt Weld

Inches	Steel	Galv.	Inches	Iron	Black	Galv.
1/4	45	19½	1/4 and 3/8	+11	+36	
1/4 to 3/8	51	25½	3/8	28	5	
3/8	56	42½	3/8	28	11	
3/8 to 1	60	48½	1 and 1¼	31	15	
1 to 3	62	50½	1½ and 2	35	18	

### Lap Weld

2	55	43½	2	23	9	
2½ to 6	59	47½	2½ to 3½	28	13	
7 and 8	56	43½	4 to 6	30	17	
9 and 10	54	42½	7 and 8	29	16	
11 and 12	53	40½	9 to 12	26	11	

### Butt Weld, extra strong, plain ends

1/4	41	24½	1/4 and 3/8	+13	+48	
1/4 to 3/8	47	30½	3/8	23	7	
3/8	53	42½	3/8	28	12	
3/8 to 1	58	47½	1 to 2	34	18	
1 to 1½	60	49½				
2 to 3	61	50½				

### Lap Weld, extra strong, plain ends

2	53	42½	2	29	13	
2½ to 4	57	46½	2½ to 4	34	20	
4½ to 6	56	45½	4½ to 6	33	19	
7 to 8	52	39½	7 and 8	31	17	
9 and 10	45	32½	9 to 12	21	8	
11 and 12	44	31½				

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	Charcoal Iron
2 in. and 2½ in. 40	1½ in. 1
2½ in.—2½ in. 48	1½ in. 8
3 in. 54	2 in.—2½ in. 13
3½ in.—3½ in. 56	2½ in.—2½ in. 16
4 in. 59	3 in. 17
4½ in. to 6 in. 48	3½ in. to 3½ in. 18
	4 in. 20
	4½ in. 21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

### Standard Commercial Seamless Boiler

#### Tubes

Hot Rolled	Cold Drawn
1 in. 63	3 in. 48
1½ to 1½ in. 55	3½ to 3½ in. 50
1½ in. 39	4 in. 53
2 to 2½ in. 34	4½, 5 and 6 in. 42
2½ to 2½ in. 42	

### Hot Rolled

2 and 2½ in. 40	3½ to 3½ in. 56
2½ and 2½ in. 48	4 in. 59
3 in. 54	4½, 5 and 6 in. 48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30%, base (carloads). 55

Carbon, 0.30% to 0.40%, base.....50

Plus differentials for lengths over 18 ft. and

for commercial exact lengths. Warehouse dis-

counts on small lots are less than the above.

promises this month to exceed that of January. The market is steady as 2.20c., base Pittsburgh.

**Hot-Rolled Flats.**—Several hot-rolled strip manufacturers have announced an advance of \$2 a ton, and it is probable that the advance will become general before the end of the week. This would make strips narrower than 6 in. 2c., base, and those from 6 in. to 24 in., 1.90c., and place cooperage stock at 2.20c., base Pittsburgh. All producers are heavily obligated, particularly so on the very narrow widths, on which delivery promises on new inquiries are frequently not less than six weeks. Local mills have not had to quote the Chicago base on some sales of 2 in. stock for prompt shipment into the Chicago district, on which the Pittsburgh base and the full freight from Pittsburgh were obtained. In addition to heavy commitments, mills are prompted in the latest price advance by the possibility of higher billet and slab price for second quarter shipment. Specifications on contracts are heavy.

**Cold-Rolled Strips.**—There is no letdown in the anxiety of consumers to get shipments on contracts, and, with releases on orders about approximating the shipments, makers are in a strong position to demand on new business the advance they recently announced. Most of the shipments are invoiced at 2.85c., base, but on new business 2.95c., base, is commonly named.

**Sheets.**—Extreme activity continues in full-finished sheets for automobile bodies, and this demand is the principal prop to sustained mill operations of around 95 per cent of capacity. The demand for the common finishes is good, but lacks the volume and urgency of that for automobile body sheets. Some mills do not seem to have very large order books in ordinary black sheets or in galvanized sheets; price concessions, particularly in the latter, are believed to be due to that condition. At the same time, there is talk of higher prices on both grades and on blue annealed sheets, higher prices for the latter being prompted by the announcement of an advance of \$2 a ton just made on hot-rolled strips.

**Tin Plate.**—Specifications still are sufficient to sustain an average mill engagement of about 90 per cent of capacity. Business apart from releases on contracts does not amount to much.

**Old Material.**—The fact that the heavy melting steel in the February scrap list of the Pennsylvania Railroad brought about \$19.40, delivered to a Pittsburgh district steel company, on a direct bid, has tended to check the downward tendency recently noted in that grade. While steel makers as a rule are not interested in additional supplies, dealers are not much disposed to seek orders for a grade they feel they will not be able to secure except at prices that would prove unprofitable on account of competition created by the increased ten-

dency among mills to buy direct. The open market on heavy melting steel is hardly quotable at more than \$19, but any sales that might take place at the price would be for material for fairly extended delivery. Dealers are bidding \$18.25 and \$18.50 to cover short sales, but do not appear to be able to pick up much tonnage at less than the latter price. The quotable range, therefore, is \$18.50 to \$19. One mill in the district bought a fair-sized lot of compressed sheets at \$18.50. Bundled sheet sides and ends are \$16.50 bid and \$17 asked. On machine shop turnings, \$11.75 is as high as has been paid by local consumers in the past week, although they have sold in Detroit at the equivalent of \$12 here. Blast furnace grades also are selling lower in this market than the prices at which they can be brought here profitably from Detroit. Heavy breakable cast has only a limited sale and the principal outlet is to dealers with short orders to cover. Steel in the February scrap list of the Baltimore & Ohio Railroad is reported to have sold at \$19.10, Pittsburgh and Cleveland, and the rails at slightly under \$19.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

Basic Open-Hearth Grades:		
No. 1 heavy melting steel.	\$18.50 to	\$19.00
No. 2 heavy melting steel.	16.75 to	17.00
Scrap rails	17.75 to	18.25
Compressed sheet steel.		18.50
Bundled sheets, sides and ends	16.50 to	17.00
Cast iron carwheels.	15.00 to	15.50
Sheet bar crops, ordinary.	18.50 to	19.00
Heavy breakable cast.	13.00 to	13.50
No. 2 railroad wrought.	18.50 to	19.00
Hvy. steel axle turnings.	16.50 to	17.00
Machine shop turnings.	11.50 to	11.75
Acid Open-Hearth Grades:		
Railr. knuckles and couplers	20.00 to	20.50
Railr. coil and leaf springs	20.00 to	20.50
Rolled steel wheels.	20.00 to	20.50
Low phos. billet and bloom ends	22.00 to	22.50
Low phos. mill plates.	20.50 to	21.00
Low phos. light grades.	19.50 to	20.00
Low phos. sheet bar crops	20.50 to	21.00
Heavy steel axle turnings.	16.50 to	17.00
Electric Furnace Grades:		
Low phos. punchings.	19.50 to	20.00
Hvy. steel axle turnings.	16.50 to	17.00
Blast Furnace Grades:		
Short shoveling steel turnings	12.50 to	13.00
Short mixed borings and turnings	12.50 to	13.00
Cast iron borings.	12.50 to	13.00
Rolling Mill Grades:		
Steel car axles.	21.00 to	22.00
No. 1 railroad wrought.	14.50 to	15.00
Sheet bar crops.	20.50 to	21.00
Cupola Grades:		
No. 1 cast.	15.00 to	15.50
Rails 3 ft. and under.	19.50 to	20.00

**Coke and Coal.**—Beehive furnace coke has strengthened in price in the past week as a result of rather large purchases by steel companies to supplement by-product oven output and a strong demand for coke for heating and household uses. As much as \$3 per net ton is being obtained for small lots of Connellsville 48-hr. coke, and on larger tonnages producers are having no trouble in getting \$2.85. Cold weather has caused a demand for coke for household use that the by-product coke ovens are unable to supply. Crushed beehive oven coke has been called for to help out. Beehive oven coke production has not increased so much or as rapidly as the demand; hence, the stronger prices.

## Detroit

### Automobile Production on an Ascending Scale

DETROIT, Feb. 11.—Repeated weekly increases in the number of men employed in Detroit industrial establishments reflect the ascending scale of operations in automobile and allied plants. Since Jan. 1, the weekly increases have been between 2500 and 4000. The increase last week was 2617, bringing the total employment of the reporting companies to 292,228, compared with a total of 225,292 a year ago. Employment has increased also at Toledo.

The Ford Motor Co. has turned out its millionth model A car; the Chevrolet plants are scheduled to turn out 125,000 cars this month, against a total for January of 86,178; Buick built 13,008 cars in January, and expects to make 14,000 this month; the Hudson Motor Car Co. has scheduled 110,000 units for the first quarter against an output of 91,500 in the first quarter of 1928; Graham-Paige's production is running about three times that of the same time last year, and the Olds Motor Works shipped 7460 cars in January, against 1636 in the same month last year.

There have been no developments in the scrap situation in this district other than a drop of 50c. per ton on long turnings. There is a noticeable tendency to weakness.

*Dealers' buying prices per gross ton, f.o.b. cars, Detroit:*

Hvy. melting and shov. steel	\$15.00 to	\$15.50
Borings and short turnings	10.00 to	10.50
Long turnings	8.75 to	9.25
No. 1 machinery cast.	14.00 to	15.00
Automobile cast.	20.00 to	21.00
Hydraulic comp. sheets.	14.75 to	15.25
Stove plate	11.00 to	12.00
No. 1 bushing.	11.00 to	11.50
Sheet clippings	9.00 to	9.50
Flashings	13.00 to	13.50

### Steel Corporation's Orders Gained in January

A moderate increase in the unfilled orders on the books of the United States Steel Corporation was registered in January. The increase was 132,775 tons. On Jan. 31 the total unfilled business amounted to 4,109,487 tons, comparing with 3,976,712 tons on Dec. 31, 1928. A year ago, the unfilled tonnage was 4,275,947 tons. The increase last month compares with an increase in December of 303,712 tons, and with a decrease in November of 78,030 tons. In August, September and October, increases were made. The table gives the reported figures for the last 13 months.

		1929	1928
Jan.	31	4,109,487	4,275,947
Feb.	28		4,398,189
March	31		4,335,206
April	30		3,872,133
May	31		3,416,822
June	30		3,637,009
July	31		3,570,927
Aug.	31		3,624,043
Sept.	30		3,698,368
Oct.	31		3,751,030
Nov.	30		3,673,000
Dec.	31		3,976,712

# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

Billets and Blooms		Sheet Bars		Skelp	
	Per Gross Ton	(Open hearth or Bessemer)	Per Gross Ton	(F.o.b. Pittsburgh or Youngstown)	Per Lb.
Rerolling, 4 in. and under 10 in.				Grooved	1.90c.
Pittsburgh	\$33.00	Pittsburgh	\$34.00	Universal	1.90c.
Rerolling, 4 in. and under 10 in.		Youngstown	34.00	Sheared	1.90c.
Youngstown	33.00	Cleveland	34.00		
Rerolling, 4 in. and under 10 in.		Slabs		Wire Rods	
Cleveland	\$33.00 to 34.00	(8 in. x 2 in. and under 10 in. x 10 in.)	Per Gross Ton	(Common soft, base)	Per Gross Ton
Rerolling, 4 in. and under 10 in.				Pittsburgh	\$42.00
Chicago	35.00	Pittsburgh	\$33.00	Cleveland	42.00
Forging quality, Pittsburgh	38.00	Youngstown	33.00	Chicago	43.00
		Cleveland	33.00		

## Prices of Raw Material

Ores		Ferromanganese		Fluxes and Refractories	
Lake Superior Ores, Delivered Lower Lake Ports			Per Gross Ton	Fluorspar	
	Per Gross Ton				Per Net Ton
Old range Bessemer, 51.50% iron	\$4.55	Domestic, 80%, seaboard	\$105.00	Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	\$18.00
Old range non-Bessemer, 51.50% iron	4.40	Foreign, 80%, Atlantic or Gulf port, duty paid	105.00	No. 2 lump, Illinois and Kentucky mines	20.00
Mesabi Bessemer, 51.50% iron	4.40	Spiegeleisen		Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.00 to 19.00
Mesabi non-Bessemer, 51.50% iron	4.25		Per Gross Ton Furnace	Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines	32.50
High phosphorus, 51.50% iron	4.15	Domestic, 19 to 21%	\$31.00 to \$34.00		
Foreign Ore, c.i.f. Philadelphia or Baltimore		Domestic, 16 to 19%	29.00 to 32.00		
	Per Unit	Electric Ferrosilicon			
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.		Per Gross Ton Delivered		
Iron ore, low phos., Swedish, average 68% iron	10.00c.	50%	\$83.50		
Iron ore, basic Swedish, average 65% iron	9.00c.	75%	130.00		
Manganese ore, washed, 52% manganese, from the Caucasus	36c. to 38c.		Per Gross Ton Furnace		
Manganese ore, Brazilian, African or Indian, basic 50%	35c. to 37c.	10%	\$35.00		
Tungsten ore, high grade, per unit, in 60% concentrates	\$11.75 to \$12.00	11%	37.00		
Chrome ore, 45 to 50% Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00				
Molybdenum ore, 85% concentrates of MoS <sub>2</sub> , delivered	50c. to 55c.	Bessemer Ferrosilicon			
			Per Gross Ton		
		F.o.b. Jackson County, Ohio, Furnace			
		10%	\$31.00		
		11%	33.00		
		Silvery Iron			
			Per Gross Ton		
		F.o.b. Jackson County, Ohio, Furnace			
		6%	\$24.00		
		7%	25.00		
		8%	26.00		
		9%	27.00		
		Other Ferroalloys			
			Per Gross Ton		
		Ferrotungsten, per lb., contained metal del'd	98c. to \$1.05		
		Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb., contained Cr. delivered, in carloads	11.00c.		
		Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65		
		Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00		
		Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	\$91.00		
		Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	\$122.50		
		Fire Clay Brick			
			Per 1000 f.o.b. Works		
			High-Heat Duty Brick	Intermediate Heat Duty Brick	
			Pennsylvania	\$43.00 to \$46.00	\$35.00 to \$38.00
			Maryland	43.00 to 46.00	35.00 to 38.00
			New Jersey	50.00 to 65.00	
			Ohio	43.00 to 46.00	35.00 to 38.00
			Kentucky	43.00 to 46.00	35.00 to 38.00
			Missouri	43.00 to 46.00	35.00 to 38.00
			Illinois	43.00 to 46.00	35.00 to 38.00
			Ground fire clay, per ton	7.00	
		Silica Brick			
			Per 1000 f.o.b. Works		
			Pennsylvania	\$43.00	
			Chicago	52.00	
			Birmingham	50.00	
			Silica clay, per ton	\$8.50 to 10.00	
		Magnesite Brick			
			Per Net Ton		
			Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00	
			Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00	
			Standard size	45.00	
		Chrome Brick			
			Per Net Ton		
			Standard size	\$45.00	

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts		Bolts and Nuts		Small Rivets	
	Per 100 Pieces		Per Cent Off List	(1/8-In. and Smaller)	Per Cent Off List
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)		Semi-finished hexagon nuts	70	F.o.b. Pittsburgh	70 and 10
	Per Cent Off List	Semi-finished hexagon castellated nuts, S.A.E.	70	F.o.b. Cleveland	70 and 10
†Machine bolts	70	Stove bolts in packages, Pittsburgh	80, 10 and 5	F.o.b. Chicago	70 and 10
†Carriage bolts	70	Stove bolts in packages, Chicago	75, 20, 10 and 5		
Lag bolts	70	Stove bolts in packages, Cleveland	75, 20, 10 and 5		
Plow bolts, Nos. 1, 2, 3 and 7 heads	70	Stove bolts in bulk, Pittsburgh	80, 10, 5 and 2 1/2		
Hot-pressed nuts, blank or tapped, square	70	Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2 1/2		
Hot-pressed nuts, blank or tapped, hexagons	70	Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2 1/2		
C.p.c. and t. square or hex. nuts, blank or tapped	70	Tire bolts	60, 5 and 5		
Washers*	70c. to 6.75c. per lb. off list				
		Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.			
		Large Rivets			
		(1/2-In. and Larger)	Base per 100 Lb.		
		F.o.b. Pittsburgh or Cleveland	\$2.90 to \$3.10		
		F.o.b. Chicago	3.00 to 3.20		
		Cap and Set Screws			
		(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	Per Cent Off List		
		Milled cap screws	80, 10 and 5		
		Milled standard set screws, case hardened	80 and 5		
		Milled headless set screws, cut thread	75 and 10		
		Upset hex. head cap screws, U.S.S. thread	85		
		Upset hex. cap screws, S.A.E. thread	85		
		Upset set screws	80, 10 and 5		
		Milled studs	70		

\*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

# Chicago

## Steel Orders Equal to Shipments—Record First Quarter Expected—Active Buying of Pig Iron

CHICAGO, Feb. 11.—The Chicago iron and steel market remains steady, with incoming business balancing shipments. In both bookings and deliveries the first quarter shows marked improvement over the corresponding period a year ago, and it is not improbable, according to local producers, that shipments in the first three months of this year will exceed the record of the best previous first quarter. Buyers, most of whom are now able to plan their schedules farther in advance, are anxious to specify ahead, the average now being between 60 and 90 days. With operations at 92 per cent of ingot capacity, producers find that closer apportionment of steel is necessary to finishing departments. For this reason rail mills are being held to 80 per cent of capacity in spite of schedules that call for much heavier output.

Western railroads have ordered more than 3000 cars which will require upward of 40,000 tons of steel. Structural awards total 8000 tons and the pending list has grown by not less than 17,000 tons.

Sales of scrap show that prices are leaning toward weakness. A steel mill has taken a round tonnage of hydraulic bundles at \$14.75 a gross ton, delivered, or 25c. below quotations last week.

Chicago producers of hot-rolled strip steel have announced on advance of \$2 a ton, effective Feb. 16.

**Pig Iron.**—Second quarter buying of Northern foundry iron is active, and it is conservatively estimated that fully 50 per cent of normal second quarter requirements already has been contracted for. Shipments grow heavier, and the daily average so far in February is about 5 per cent greater than in January. A Milwaukee user has bought 1000 tons of basic iron and a melter west of Chicago will purchase a like tonnage of foundry iron. Furnace stocks are no larger than at the turn of the year, but they are better balanced. Shipments of charcoal iron are heavy. Low prices still are quoted.

*Prices per gross ton at Chicago:*

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super, charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	\$22.51 to 23.01
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	30.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferroalloys.**—Scattered carloads of spiegeleisen have been sold at \$34 a ton, Hazard, Pa. No test has been made of prices on tonnage lots. Specifications for ferroalloys are heavy.

*Prices delivered Chicago:* 80 per cent ferromanganese, \$112.56; 50 per cent ferrosilicon, \$83.50 to \$88.50; spiegel-eisen, 19 to 21 per cent, \$40.76.

**Coke.**—Melters continue to take record shipments of foundry coke. Spot sales are light at \$8, f.o.b. local ovens.

**Plates.**—Orders for plates total about 30,000 tons. The bulk of this, or about 25,000 tons, is for a pipe line. Several users of oil storage tanks have ordered 1800 tons of plates from local mills. Denver, Colo., is

again taking bids on a water pipe project which will require 12,000 tons of plates. Mounting demands for plates are having their effect on deliveries, which have been pushed ahead from a range of two to three weeks at the turn of the month to not better than 30 days for practically all sizes. The Elgin, Joliet & Eastern has placed orders for 250 gondola cars and will build 75 flat cars in its own shops. The Illinois Central has ordered 2900 cars which will require 35,000 tons of steel. Car shops have specified an additional 10,000 tons of steel.

*Mill prices on plates, per lb.: 2c. to 2.10c. base, Chicago.*

**Reinforcing Bars.**—Montgomery Ward & Co., Chicago, have placed through their contractor 1300 tons of reinforcing bars for an addition to its local warehouse. Awards other than this are small. Warehouse shipments in January were below normal, notwithstanding that shop books contained a fair tonnage. Cold weather in January accounts for the curtailment in shipments. An order has been placed for 800 tons of reinforcing mesh for a Chicago building. More than 5000 tons of reinforcing bars were purchased last fall for this project.

**Structural Material.**—Structural awards in this district total 6000 tons for new buildings and 1500 tons for river barges. Fresh inquiry, at 16,000 tons, is larger than in recent weeks and promises relief to a number of local shops that are anxiously looking for work. Fabricators in outlying districts have been handicapped by the severity of this winter for the reason that erection has been slow and in some cases jobs have been stopped until more favorable weather prevails for outdoor construction. Orders for structural materials are in moderate tonnage. Mill prices for shapes are steady at 2c. to 2.10c. per lb., Chicago.

*Mill prices on plain material, per lb.: 2c. to 2.10c. base, Chicago.*

**Bars.**—Mild steel bar sales and specifications show marked improvement over those of the previous week. Deliveries for many sizes have been crowded farther into the future, though it is still possible to obtain delivery promises of four to five weeks. All Chicago district bar mills are fully engaged. Forgers in this

district are operating at close to capacity, notwithstanding that one large automobile manufacturer withdrew numerous orders when it substituted malleable castings for many forgings. Automobile output in January was about 400,000 cars. Manufacturers of farm implements and tractors, having put to use plant additions completed late last year, are now drawing on steel mills for increased needs. Specifications for rail steel bars show further improvement and again are equal to shipments. New buying is light, but on the business taken 1.95c. per lb., Chicago Heights, is firm. Barn equipment manufacturers are anticipating an active season and now are making inquiries for their rail steel bar requirements. A fair volume of fence posts is being shipped from this district.

**Wire Products.**—Spot sales are fully equal to the average in recent weeks, and shipments are steady to jobbers and to the manufacturing trade. Demand is a trifle ahead of production, and mill stocks are smaller than at the turn of the year. This is especially true of nails and woven wire fencing. Jobbers, anticipating an active spring demand, are building heavier stocks than is usual at this time of the year. Throughout the middle and southern portion of the country distributors are finding business improved, but in the North and Northwest, sales are sluggish. Automobile manufacturers' needs so far this year are a shade less than in the corresponding period a year ago.

**Rails and Track Supplies.**—Output of standard-section rails remains at 80 per cent of capacity, not because shipping schedules do not call for heavier production, but, with all steel mill units operating at or near capacity, the apportionment of ingots will not at this time allow heavier rollings of rails. Several Western railroads have ordered a total of 6000 tons of tie plates and 10,000 kegs of spikes. Southwestern railroads have closed for the bulk of their tie plate requirements and less is now heard about price concessions in that highly competitive territory. Orders for light rails are the best in three or four months. New purchases come from coal mining districts and copper mine operators.

*Prices f.o.b. mill, per gross ton:* Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

**Bolts, Nuts and Rivets.**—Specifications are steady and readily support output between 65 and 70 per cent of capacity. A few scattered orders for large rivets have been placed at \$3.20 per 100 lb.

**Cast Iron Pipe.**—Prices for cast iron pipe are steady at \$37 to \$38 a ton, Birmingham, as indicated by awards and bids made during the past week. The Alabama Pipe Co. is low bidder at \$36.80 a ton, Birmingham, on a sizable tonnage of pipe on which a contract will be placed Feb. 12, by

Kenosha, Wis. The United States Cast Iron Pipe & Foundry Co. has taken 100 tons of 6-in. pipe for Elgin, Ill., at \$37.80 a ton, Birmingham. The McWane Cast Iron Pipe Co. will furnish 12 carloads for St. Clairsville, Ohio. Cincinnati will buy 1000 tons of 6 to 12-in. pipe and Rosedale, Mich., is in the market for 110,000 ft. of 6, 8 and 12-in. pipe. A number of large inquiries are taking shape in Illinois, and the trade expects several municipalities in Michigan to enter the market soon. This market is now more active than it has been in six or eight weeks. Deliveries for most sizes are prompt though several foundries have order books of three weeks in the 4 to 8-in. sizes.

*Prices per net ton, deliv'd Chicago:* Water pipe, 6-in. and over, \$45.20 to \$46.20; 4-in., \$49.20 to \$50.20; Class A and gas pipe, \$3 extra.

**Sheets.**—Recent sales in this district disclose that prices are firm on all business except where competition is met in the Southwest and at scattered points in the West. Reports of impending advances in quotations are being circulated, but formal announcements have not yet been made by producers. Stocks in the hands of users are said to be low. Deliveries are prompt and buyers find little need for issuing specifications against old commitments or in making new purchases for other than nearby requirements. Specifications and new business for immediate delivery closely balance shipments. Chicago mills continue to operate on a week to week basis. This situation prevailed throughout January, yet one producer in that month established a record in output. The roofing trade remains quiet while continued cold weather holds outdoor work in check.

*Base prices per lb., deliv'd from mill in Chicago:* No. 24 black sheets, 3.00c.; No. 24 galv., 3.75c.; No. 10 blue ann'l'd, 2.25c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

**Old Material.**—Tendencies in the Chicago scrap market are mixed and opinions vary widely as to the outcome of the present state of unsettlement. A local steel mill has purchased a tonnage of heavy melting steel at \$16.50 a gross ton, delivered.

#### Warehouse Prices, f.o.b. Chicago

Base per Lb.	
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel.....	2.35c.
Reinforc'g bars, rail steel.....	2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands (1/4 in. in Nos. 10 and 12 gages).....	3.20c.
Hoops (No. 14 gage and lighter).....	3.75c.
Black sheets (No. 24).....	3.80c.
Galv. sheets (No. 24).....	4.65c.
Blue ann'l'd sheets (No. 10).....	3.35c.
Spikes, stand. railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, sq., tap. or blank.....	60
Hot-pressed nuts, hex., tap. or blank.....	60
No. 8 black ann'l'd wire, per 100 lb.....	\$3.30
Com. wire nails, base per keg.....	3.20
Cement c'd nails, base per keg.....	3.20

This price is the high point reached in the recent move upward. Brokers, in filling old commitments, are not hesitating to pay the above price for tonnages that are to be shipped against old orders. On the other hand, prices for cast iron borings are weak. Up to 10 days ago the supply in and near Chicago was short of demand and this led brokers to go far afield in seeking supplies. This move appears to have been successful, for suddenly the supply, augmented by larger output locally, has climbed above demand and brokers are having difficulty in placing cars as they appear on track. High prices for cast grades, especially railroad malleable, are leading more foundrymen to revise their mixtures. Short rails are still scarce and prices are strong. Taken as a whole, this market is leaning to the weak side but many in the trade feel that this is a temporary situation. Railroad offerings are numerous. Lists are as follows: Rock Island, 5000 tons; Missouri-Kansas-Texas, 5000 tons; Pullman Co., 500 tons; Chicago & Eastern Illinois, 800 tons; the Pere Marquette, 2000 tons.

#### Prices deliv'd Chicago district consumers: Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$16.00 to \$16.50
Shoveling steel.....	16.00 to 16.50
Frogs, switches and guards, cut apart, and misc. rails	17.00 to 17.50
Hydral, compressed sheets	14.25 to 14.75
Drop forge flashings.....	12.00 to 13.00
Forg'd cast and r'l'd steel carwheels.....	19.50 to 20.00
Rail'd tires, charg. box size.....	19.50 to 20.00
Rail'd leaf spring cut apart.....	19.50 to 20.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	17.00 to 17.50
Coil springs.....	19.50 to 20.00
Electric Furnace Grades:	
Axle turnings.....	15.25 to 15.75
Low phos. punchings.....	17.75 to 18.25
Low phos. plate, 12 in. and under.....	17.75 to 18.25
Blast Furnace Grades:	
Axle turnings.....	12.75 to 13.25
Cast iron borings.....	12.00 to 12.50
Short shoveling turnings.....	12.00 to 12.50
Machine shop turnings.....	9.50 to 10.00
Rolling Mill Grades:	
Iron rails.....	16.00 to 16.50
Rerolling rails.....	17.50 to 18.00
Cupola Grades:	
Steel rails less than 3 ft.....	19.00 to 19.50
Steel rails less than 2 ft.....	20.00 to 20.50
Angle bars, steel.....	17.50 to 18.00
Cast iron carwheels.....	14.50 to 15.00
Malleable Grades:	
Railroad.....	19.50 to 20.00
Agricultural.....	16.50 to 17.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.....	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angles and splice bars	15.00 to 15.50
Iron arch bars and transoms.....	21.25 to 21.75
Iron car axles.....	27.50 to 28.00
Steel car axles.....	17.50 to 18.00
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	14.25 to 14.75
No. 1 bushelling.....	12.50 to 13.00
No. 2 bushelling.....	7.00 to 7.50
Locomotive tires, smooth.....	14.50 to 15.00
Pipes and flues.....	9.50 to 10.00
Cupola Grades:	
No. 1 machinery cast.....	16.50 to 17.00
No. 1 railroad cast.....	15.50 to 16.00
No. 1 agricultural cast.....	14.50 to 15.00
Stove plate.....	12.75 to 13.25
Grate bars.....	13.50 to 14.00
Brake shoes.....	12.50 to 13.00

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

## Canada

### Car Plant Takes 2200 Tons of Structural

TORONTO, ONT., Feb. 11.—Pig iron business is steady and shows improvement. Some inquiry for second quarter is appearing. The spot demand for foundry and malleable iron has reached a high level. The price situation remains unchanged, with quotations firm.

#### Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$23.60
No. 2 fdy., sil. 1.75 to 2.25.....	23.60
Malleable.....	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$25.50
No. 2 fdy., sil. 1.75 to 2.25.....	25.50
Malleable.....	25.00 to 25.50
Basic.....	24.00 to 24.50
Imported Iron, Montreal Warehouse	
Summerlee.....	33.50
Carron.....	33.00

**Structural Steel.**—Business placed during the week was mostly in small tonnages, with total awards of about 5000 tons. The Hamilton Bridge Co., Hamilton, Ont., will fabricate 2200 tons for a plant addition for the National Steel Car Corporation, Hamilton, and 650 tons for a bridge over the Welland ship canal at Thorold.

**Old Material.**—Consumers are showing interest, and several inquiries have recently appeared from Toronto and Montreal consumers for about 3000 tons of various grades. Prices are firm and unchanged.

#### Dealers' buying prices:

Per Gross Ton		
Toronto		Montreal
Heavy melting steel	\$9.50	\$8.00
Rails, scrap.....	10.00	9.00
No. 1 wrought.....	9.00	11.00 to 11.50
Machine shop turnings		
Boiler plate.....	7.00	5.00
Heavy axle turnings.....	7.50	6.00
Cast borings.....	7.50	7.50
Steel turnings.....	7.00	5.00
Wrought pipe.....	5.00	6.00
Steel axles.....	14.00	20.00
Axles, wrought iron.....	16.00	22.00
No. 1 machinery cast.....	16.00 to 17.00	17.00
Stove plate.....	13.00	13.00
Standard carwheels.....	16.00	16.00
Malleable.....	13.00	13.00
Per Net Ton		
No. 1 machinery cast.....	15.00	.....
Stove plate.....	9.00	.....
Standard carwheels.....	13.00	.....
Malleable scrap.....	13.00	.....

Coincident with a reduction of the par value of the stock of the Apollo Steel Co., Apollo, Pa., manufacturer of sheets, from \$50 to \$10 and the giving of stockholders five shares for each one now held, the shareholders will have the right to purchase one new share for each five held. Proceeds of the sale of the additional stock are to provide funds for plant extensions and improvements and to furnish working capital.

Liquidation of the Warwick Iron & Steel Co., Pottstown, Pa., which was sold at public auction last fall, is expected to be completed in March, when distribution will be made on the 150,000 shares of outstanding stock.

# New York

## Structural Steel Lettings Fall Off Slightly—Interest in Pig Iron for Second Quarter Lacking

NEW YORK, Feb. 11.—Pig iron buying is still confined to relatively small orders for fill-in purposes. Almost no interest is being taken in second quarter requirements. Sales for the week in this district showed some improvement, totaling about 8000 tons. The American Radiator Co. has closed on its inquiry for 2000 tons, which is for delivery at Gloucester, N. J., instead of Bayonne, as reported last week. The order is reported to have been placed with a furnace outside of the eastern Pennsylvania district. The Richmond Radiator Co., New York, has not yet taken action on 5000 tons for Uniontown, Pa., for which it has been in the market for several weeks. Current inquiries in this section are confined to lots of less than 500 tons. A Providence, R. I., melter, however, is in the market for 1500 tons of foundry iron. Uncertainty as to transportation charges has hampered sales of Buffalo iron for barge delivery. Barge companies have proposed to raise their rates and pig iron producers hope for a reduction in all-rail rates to New England. The price situation is unchanged, with Buffalo foundry iron bringing \$17 to \$17.50, base furnace, and eastern Pennsylvania foundry commanding \$19.50, base furnace, for shipments into this district. Occasional sales at as high as \$18, base Buffalo, are still reported. Dutch foundry iron continues to be sold in moderate lots at about \$22, port of entry, duty paid, for No. 1X. A cargo of Dutch iron is expected to land at Bridgeport, Conn., some time this month.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$21.91 to \$22.91
*Buf. No. 2, del'd east.	
N. J. ....	20.28 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

\*Price delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

**Ferroalloys.**—Sales of 200 to 300 tons of spiegeleisen for fairly prompt delivery are noted at unchanged prices. One furnace in the Pittsburgh district blew in on this alloy last month and the second largest producer is expected to produce this alloy in its second furnace some time this month. Prices are firm at \$105, seaboard. Specifications on contract are quite heavy, and this is true also of ferrosilicon, standard ferrochromium and other ferroalloys.

**Finished Steel.**—While structural steel lettings are light, a condition that is usual in January and February, the shipments of plain material from mills on projects that were

awarded late last year are heavy and mill operations are at a high rate. Building construction projects awarded in January for the greater part of the country were about 4 per cent under those of January, 1928, and figures for the first week of February indicate that this month also will fall below February, 1928, in lettings. Speculative building has been affected by the money situation, but for investment construction money is said to be available. The decreased demand for steel to be used in building is reflected in lettings reported to the Structural Steel Board of Trade of New York for January. Exclusive of bridges, subway work, etc., the total amounted to 27,000 tons, compared with 37,800 tons in December and with 30,000 tons in January, 1928. The local steel market follows a steady course. Specifications against contracts are large, but new business is light because of the fact that nearly all consumers are covered for their first quarter requirements and they have not yet become interested in second quarter contracts. The Standard Oil Co. of New Jersey, which about two weeks ago ordered 1600 tons of plates from an eastern Pennsylvania district mill for shipment to Sarnia, Ont., is inquiring for an additional 3000 tons for the same location.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c.; plates, 2.17½c.; struc. shapes, 2.14½c.; bar iron, 2.14c.

**Cast Iron Pipe.**—Inquiries from municipalities, particularly in New England, are becoming more numerous, but there is no evidence that the spring buying movement will gain any momentum for several weeks. No outstanding tonnages have been placed during the week, but a fair amount is required in projects coming out for bids. Brockton, Mass., will open bids on Feb. 14 on 1540 tons of Class B 6-in. and Class C 24-in. pipe, and Hartford, Conn., has taken bids on 500 tons of centrifugal pipe upon which action is expected at an early date. Other municipal projects on which bids have recently been taken include 220 tons of 4 to 10-in. pipe for Springfield, Mass., and 180 tons of 6 and 8-in. for Waterville, Me.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$39.60 to \$41.60; 4-in. and 5-in., \$44.60 to \$46.60; 3-in., \$54.60 to \$56.60; Class A and gas pipe, \$3 extra.

**Reinforcing Bars.**—Few lettings of 100 tons or more have been reported during the last week, the only sizable job having been a section of the subway in the Bronx, calling for 300 tons, which went to the National Bridge Works. A number of fairly large projects are in prospect, but work is not coming out in a satisfactory volume for this time of the year. Prices are steady and unchanged.

**Coke.**—Demand for furnace coke has improved somewhat in the last few days and the market is strong at \$2.85 to \$3 per net ton, Connellsville. For the foundry grade the market is rather spotty, some users specifying at a higher rate than might be expected at this time, while others are asking for less than normal shipments. The prices on this grade range from \$3.50 to \$4 a ton, Connellsville. Special brands of beehive coke are quoted at \$4.85 per net ton, ovens, or \$8.56,

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.50c.
Flats and squares	4.00c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'd sheets (No. 10)	3.85c. to 3.90c.
Long terme sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
¾ x 6 in. and smaller	60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	\$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

### Discounts on Welded Pipe

Standard Steel—	Black	Galv.
¾-in. butt.	46	29
¾-in. butt.	51	37
1-3-in. butt.	53	39
2½-6-in. lap.	48	35
7 and 8-in. lap.	44	17
11 and 12-in. lap.	37	12
Wrought Iron—		
¾-in. butt.	5	+19
¾-in. butt.	11	+9
1-1½-in. butt.	14	+6
2-in. lap.	5	+14
3-6-in. lap.	11	+6
7-12-in. lap.	3	+16

### Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

### Terne Plate (14 x 20 in.)

IC—20-lb. coating	\$10.00 to \$11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

### Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

### Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

delivered to northern New Jersey, Jersey City and Newark, and \$9.44 to New York and Brooklyn. By-product foundry coke is offered at \$9 to \$9.40 per net ton, Newark or Jersey City, and \$10.06, New York or Brooklyn.

**Warehouse Business.**—Buying from stock continues rather limited. Prices are well maintained except on sheets where the usual small concessions still appear on desirable orders.

**Old Material.**—Brokers have reduced their buying prices on No. 1 heavy melting steel to \$16 per ton, delivered Coatesville, Pa., and Claymont, Del., and to \$15.50 per ton, delivered Bethlehem and Steelton, Pa. Other grades of scrap show a tendency to weakness, with 25c. to 50c. per ton less being paid in some cases. Heavy breakable cast is off 50c. a ton and rerolling rails are down about 25c. a ton. Buying by consumers is limited, so that buying offers

of dealers and brokers are establishing the current market.

*Dealers' buying prices per gross ton, f.o.b. New York:*

No. 1 heavy melting steel	\$12.50 to \$12.85
Heavy melting steel (yard)	8.75 to 9.00
No. 1 hvy. breakable cast	12.00 to 12.50
Stove plate (steel works)	9.25 to 9.50
Locomotive grate bars	9.25 to 9.50
Machine shop turnings	8.00 to 8.25
Short shoveling turnings	8.00 to 8.25
Cast borings (blast furn. or steel works)	7.00 to 7.25
Mixed borings and turnings	7.00
Steel car axles	18.50 to 19.00
Iron car axles	24.50 to 25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	11.75 to 12.00
Forge fire	9.00 to 9.50
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought, long	11.50 to 12.00
Rails for rolling	13.50 to 13.75
Cast iron carwheels	13.00 to 13.50
Stove plate (foundry)	9.50
Malleable cast (railroad)	13.00 to 14.00
Cast borings (chemical)	11.50

*Prices per gross ton, deliv'd local foundries:*

No. 1 machry. cast	\$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

business in western Ohio in competition with Lake furnaces. A Cleveland furnace made some local sales during the week at \$19, furnace, although Valley iron at \$17.50 can be shipped into Cleveland at a slightly lower delivered price than local furnaces are quoting. Specifications from foundries in the automotive field are very heavy, and some of the furnaces that do not have stock piles to draw on are being crowded for shipments. Prices are unchanged at \$18.50 to \$19, Lake furnace, for outside shipment, the lower price being quoted by Cleveland furnaces. In Michigan, \$20 is being maintained.

*Prices per gross ton at Cleveland:*

N'th'n fdy., sil.	1.75 to 2.25	\$19.50
S'th'n fdy., 1.75 to 2.25		\$22.50 to 23.00
Malleable		19.50
Ohio silvery, 8 per cent.		29.00
Basic Valley furnace		17.50
Stand. low phos., Valley	26.50 to	27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

## Cleveland

### A \$2 a Ton Advance on Sheets and Hot-Rolled Strip Steel Expected—Business Increases in Some Lines

CLEVELAND, Feb. 11.—February has taken a start that indicates that it will equal January in the volume of steel business. The heavy demand for steel bars has made delivery more extended with some of the mills that are now filled up for four or five weeks. While mills are calling the attention of their trade to a tightening up of shipments, some buyers have been rather slow in anticipating their requirements and now are pressing for deliveries. Most sheet mills have specifications to keep them in full operation for the remainder of the quarter or longer and several producers of cold-rolled strip are in the same situation. A \$2 a ton advance on hot-rolled strip steel and on all grades of sheets except on auto body sheets appears near at hand. These advances, if put into effect, would apply to the second quarter. The automotive industry, as a whole, has increased production and most motor car makers are reported to have a good volume of dealer orders or sufficient to keep them on present schedules for some time. These continue to issue heavy specifications.

Most metal-working industries in this territory outside the automotive field are reported to be operating at about 90 per cent of capacity. Inquiry in the building field has fallen off and there were few lettings the past week. Plates continue to move rather slowly. Orders for 8000 wheels for 1000 cars recently purchased by the Wheeling & Lake Erie Railroad have been placed with two makers.

Prices are firm at 1.90c., Pittsburgh, for steel bars, plates and structural shapes. The Cleveland mill price on steel bars is 1.90c., while outside mills are holding to 1.95c., when using Cleveland as a basing point.

**Semi-Finished Steel.**—The leading local producer is receiving specifications in excess of shipments and its deliveries have been extended until the first week in March. If expected advances in sheets and hot-rolled strip become effective, an attempt will probably be made to get higher prices for semi-finished steel for the second quarter.

**Pig Iron.**—The market became more active the past week, with sales by Cleveland interests totaling 34,000 tons in foundry and malleable grades. While the larger part was for the sec-

ond quarter, there were many sales of fill-in tonnage for this quarter. A few of the larger melters have come into the market for additional iron for the present quarter. Inquiry is fairly plentiful, one producer having inquiries for 12,000 tons. An Indiana melter is in the market for 3000 tons, a Cincinnati foundry for 1300 tons and another Ohio foundry for 2000 tons. The 2000 tons reported last week as placed by an Indianapolis automobile manufacturer is understood to have gone to a Chicago furnace. Valley furnaces continue to take some

**Iron Ore.**—Ore is moving well from the docks and the dock balance on Feb. 1 was nearly 1,000,000 tons less than on the same date a year ago. The amount on Lake Erie docks on that date was 5,310,687 tons, compared with 6,288,000 tons at the same time a year ago. Shipments from docks during January were 383,703 tons, against 320,432 tons during the same month last year.

**Coke.**—The demand for by-product coke for domestic use continues in excess of the supply and in some cases an advance over the regular \$5 Ohio oven price for egg coke is being offered by dealers. Foundry coke is in good demand, with prices unchanged. Ohio by-product foundry coke is quoted at \$7.75, Painesville.

**Bolts, Nuts and Rivets.**—Bolts and nuts are in very good demand from the automotive industry and orders from other consumers and jobbers are fair. Second quarter prices will probably not be announced until March, but an advance is not expected. Rivets are moving well on contracts, but the new prices have not been tested.

**Sheets.**—Talk of a \$2 a ton price advance in the next few days on black, blue annealed, and galvanized sheets is persistent. A leading producer has made an advance to 2.20c., Pittsburgh, on blue annealed sheets, but this so far appears to be the only official notice of a price change. There seems to be no intention to advance auto body sheets. While the advances, if made, are expected to become effective at once, they will apply to very little first quarter business, as consumers are under contract. Mills continue to get a heavy flow of specifications from the motor car industry, and deliveries are becoming somewhat more extended. One producer now has its rolling schedules filled on black sheets in various finishes and auto body sheets until the week of May 11. Galvanized sheets continue

#### Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands, No. 12 to 14 in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.50c.
Galvanized sheets (No. 24)	4.45c.
Blue ann'd sheets (No. 10)	3.25c.
No. 9 ann'd wire, per 100 lb.	\$2.95
No. 9 gal. wire, per 100 lb.	3.40
Com. wire nails, base per keg	2.95

\*Net base, including boxing and cutting to length.

quiet and irregular, with concessions of \$2 a ton rather common.

**Strip Steel.**—Specifications for hot-rolled strip continue heavy, although there is lack of uniformity in the size of order books. While some mills are filled up for the quarter, others can make deliveries in two to four weeks. An early price advance of \$2 a ton is predicted. The best delivery now promised on cold-rolled strip is three weeks, and several of the mills are filled up with specifications for the remainder of the quarter. While most producers are holding to the advanced 2.95c. Cleveland price, cold-rolled strip can still be bought at 2.85c.

**Wire Products.**—Mills are getting good specifications from manufacturers of wire, but these are still against last quarter contracts carrying the old prices. New demand for nails is slow. However, some car lot sales are being made at present prices.

**Reinforcing Bars.**—Inquiry for small lots has improved. The only sizable inquiry is for 200 tons for an Ohio Bell Telephone Co. building in Akron.

**Old Material.**—The market is holding rather steady; with little change in prices since the downward revision on some grades reported last week. While scrap is coming out in somewhat better volume than recently, the market by no means is being flooded. In steel making scrap the weakening was mostly on lighter melting steel used by one of the Cleveland mills, for which dealers are paying a maximum of \$15.50. No. 1 railroad scrap ranges from \$17 to \$17.50 for local delivery. Turnings are inclined to weakness because a Valley mill is holding up shipments. One dealer paid \$11 for this grade during the week, but has withdrawn that price. Blast furnace scrap is also slightly weaker, \$11.75 now being the maximum. Railroad wrought is firmer. Cast scrap is firm and plentiful. Some of the steel foundries are getting busier, stimulating the demand for low phosphorous scrap.

*Prices per gross ton delivered consumers' yards:*

Basic Open-Hearth Grades	
No. 1 heavy melting steel.	\$15.25 to \$15.50
No. 2 heavy melting steel.	15.00 to 15.25
Compressed sheet steel.	15.00 to 15.50
Light bundled sheet stamp'gs	12.00 to 12.50
Drop forge flashings.	13.00 to 13.25
Machine shop turnings.	10.75 to 11.00
No. 1 railroad wrought.	13.25 to 13.50
No. 2 railroad wrought.	16.00 to 16.50
No. 1 busheling.	12.50 to 13.00
Pipes and flues.	9.00 to 9.50
Steel axle turnings.	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops.	19.00 to 19.50
Low phos., billet, bloom and slab crops.	18.50 to 19.00
Low phos. sheet bar crops.	18.00 to 18.50
Low phos. plate scrap.	18.00 to 18.50
Blast Furnace Grades	
Cast iron borings.	11.50 to 11.75
Mixed bor'g and short turn'gs	11.50 to 11.75
No. 2 busheling.	11.50 to 11.75
Cupola Grades	
No. 1 cast.	16.50 to 17.00
Railroad grate bars.	11.00 to 12.00
Stove plate.	12.00 to 12.50
Rails under 3 ft.	16.75 to 17.25
Miscellaneous	
Railroad malleable.	16.00 to 16.50
Rails for rolling.	16.25 to 16.50

## Philadelphia

### Blue Annealed Sheets Advanced \$2 a Ton—District Forging Shops Well Occupied on Ford Work

PHILADELPHIA, Feb. 11.—An advance of \$2 a ton on blue annealed sheets for second quarter has been announced by two makers and others are expected to take like action. Demand for bars in eastern Pennsylvania has been increasing lately as a number of local forging plants are operating a large part of their capacity on contracts for the Ford Motor Co. for the first time since the old model was discontinued. In the past week the Pennsylvania Railroad has been specifying a larger tonnage than usual against its contracts for bars, plates and shapes. Weakness in iron and steel scrap prices continues.

**Pig Iron.**—About the only sizable pig iron purchase of the week was 5000 tons of basic from a steel mill furnace, by a Pottsville, Pa., consumer. A Claymont, Del., mill is expected to be in the market soon for a tonnage of basic iron. A consumer at Phoenixville, Pa., which inquired some weeks ago for about 4000 tons of basic, is not expected to buy. The foundry iron market is quiet, with purchases limited to carload lots at the full \$21 per ton quotation for current and second quarter delivery. The J. L. Mott Co., Trenton, N. J., is inquiring for two carloads of foundry iron. Low phosphorus demand continues quiet in this district, and the price is unchanged.

*Prices per gross ton at Philadelphia:*

East. Pa. No. 2, 1.75 to 2.25 sil.	\$21.26 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. 1X.	22.26 to 22.76
Basic (del'd east. Pa.)	19.75 to 20.25
Gray forge.	20.50 to 21.00
Malleable.	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. f.o.b. furnace.	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.	25.29
Va. No. 2X, 2.25 to 2.75 sil.	25.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

**Bars.**—Mills are well filled with tonnage and report a good demand from eastern Pennsylvania forging plants working on orders for the Ford Motor Co. Steel bar prices are firm at 1.90c., Pittsburgh, or 2.22c., Philadelphia.

**Shapes.**—Mills are maintaining a good rate of operation, with demand from fabricators increasing as spring approaches. Among the more important local projects requiring fabricated steel is a building for the Pennsylvania Railroad at Sixteenth and Filbert Streets, in which 10,000 tons will be used. The price situation is unchanged, with 2c. per lb., f.o.b. nearest mill to consumer, or 2.06c. per lb., Philadelphia, applying on most business, but 1.95c., f.o.b. mill, or 2.01c., Philadelphia, is obtainable on desirable tonnages.

**Plates.**—Operations of eastern Pennsylvania producers range from 65 to 80 per cent. Current buying is small, but is well distributed over the consuming field. Prices are firm at 2c., Coatesville, or 2.10c., delivered Philadelphia.

**Warehouse Business.**—Jobbers have advanced the quotation on cold-finished steel \$1 a ton to 3.50c. per lb.

on rounds and hexagons and to 4c. per lb. on squares and flats. Business is smaller than in January, which was an unusually good month.

**Sheets.**—A large eastern Pennsylvania producer of blue annealed sheets and a few mills outside the district have announced an advance of \$2 a ton for second quarter contracts. As most mills are unable to offer earlier than second quarter delivery, 2.20c., Pittsburgh, is apparently the minimum price on wide sheets, with 2.10c., Pittsburgh, applicable on narrow sheets. Black and galvanized prices are unchanged, but the latter are not strong at 3.60c., Pittsburgh, or 3.92c., Philadelphia, and concessions of \$1 a ton are occasionally reported. Demand for black sheets is light, but the price is being maintained at 2.85c., Pittsburgh, or 3.17c., Philadelphia. Local consumers of sheets are operating at a good rate and are using all the tonnage being shipped on first quarter contracts.

**Imports.**—In the week ended Feb. 9, a total of 2676 tons of pig iron arrived at this port, of which 2500 tons was from the United Kingdom, 150 tons from British India and 26 tons from Norway. Other imports included 40 tons of British ferromanganese and one ton of cadmium from Germany. Steel arrivals consisted of 147 tons of steel bars, 42 tons of billets and 12 tons of rods from Sweden, 80 tons of steel bars from Belgium, nine tons of galvanized strip steel from the United Kingdom, 61 tons of structural shapes from Germany and nine tons from the Netherlands. Steel

### Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier.	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished.	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.50c.
Cold-fin. steel, sq. and flats.	4.00c.
Steel hoops	3.40c.
Steel bands, No. 12 to ⅝-in., inclus.	3.15c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.00c.
†Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.15c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅝-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

\*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base  
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

scrap imports were 15 tons from Germany, 12 tons from the United Kingdom and nine tons from France.

**Old Material.**—All grades of scrap show a slight downward trend. Holders are offering small tonnages at about 50c. a ton under recent selling prices. Consumers of No. 1 heavy melting steel have declined to buy at \$16.50 per ton, but most sellers claim that it would be difficult to make a contract even at this price because of the uncertainty of the future course of the market. Heavy breakable cast in small lots has brought \$16 per ton from consumers at Harrisburg, Pa., and Florence, N. J.

*Prices per gross ton delivered consumers' yards, Philadelphia district:*

No. 1 heavy melting steel	\$16.50 to \$17.00
Scrap T rails	16.00 to 16.50
No. 2 heavy melting steel	12.50 to 13.00
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.00 to 11.50
Hydraulic compressed, new	15.00 to 16.25
Hydraulic compressed, old	13.50 to 14.00
Machine shop turnings (for steel works)	11.25 to 11.75
Heavy axle turnings (or equiv.)	13.50 to 14.00
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	16.00
Railroad grate bars	12.50 to 13.00
Stove plate (for steel works)	12.50 to 13.00
No. 1 low phos., hvy., 0.04% and under	20.00 to 21.00
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	18.50
No. 1 blast furnace scrap	10.00 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	15.50 to 16.00
Shafting	18.50 to 19.00
Steel axles	22.00 to 23.00
No. 1 forge fire	13.00 to 13.50
Cast iron carwheels	16.50 to 17.00
No. 1 cast	16.50
Cast borings (for chem. plant)	15.00
Steel rails for rolling	17.00 to 17.50

## Alan Wood Co. Main Office to Be at Ivy Rock, Pa.

The executive offices of the new Alan Wood Co., successor to the Alan Wood Iron & Steel Co., will be moved next month from the Widener Building, Philadelphia, to the company's office building at Ivy Rock, Pa. A Philadelphia sales office will be maintained in the Widener Building in charge of William Dixon, district manager of sales.

## Metal Merchants Hold Annual Dinner

The fifth annual dinner of the Metal Merchants Credit Association, New York, was held at the Waldorf-Astoria Hotel, Feb. 7. The dinner was followed by an entertainment. Ernest H. Katz, of the Bayonne Steel Co., New York, as first vice-president presided in the absence of the president of the association, Richard H. Lippincott, Jr., Dickerson-Van Dusen & Co., New York, who was too ill to attend and whose death occurred the following day. At the conclusion of the dinner, Franklin E. Devlin, permanent secretary, presented to the association a gavel and block made of wood from the frigate *Constitution*. Representatives of a number of steel companies were guests.

# Recommends Licensing Trade Associations

## Federal Trade Commission Urges Law to Control Organized Statistical Work and Price Reporting

WASHINGTON, Feb. 12.—Increased Government control over private business would result if Congress were to act favorably upon a recommendation of the Federal Trade Commission in a report today that trade associations be licensed.

The commission made the recommendation along with many others in its exhaustive report to Congress on its investigation of open price trade associations as called for by a Senate resolution. The recommendation was made in connection with the contention that trade associations should be given a definite place and responsibility in the social order. The proposed licensing system, it was declared, would be "designed not so much as an instrument of regulation, but rather as an important means of providing the Government with full knowledge of what the trade associations are doing."

### Wants Law to Compel Statistical Returns

Another outstanding recommendation is that the Bureau of Census be given power to compel the return of statistical data needed from all manufacturers and dealers, "insuring satisfactory development of trade statistics with regard to accuracy and comparability from month to month." Some authorities contend that the bureau now virtually has such power.

"A frank and above board interest in the standardization of certain practices that practically, and too often covertly, affect costs to the buyer is a field for trade association activity of much promise," said the report. "To keep such work free from the taint of conspiracy and illegal restraint of trade is, however, an important task for the permanent pilots of trade associations, and one in which they need outside advice and assistance."

The report pointed out that there has been a marked development since the war of statistical work, largely through cooperation between trade associations and the Government, and this development, it was stated, is bound to go much further. "There is no good reason why price statistics should not be covered in this way," it was said, "and there is a presumptive reason in the nature of trade statistics why the Government should have the authority to obtain them whenever their compilation and publication is deemed in the public interest. Government participation in trade statistics has in its favor the fact that it warrants unqualifiedly the making of the statistics available generally, instead of accepting the situation that involves attempts to use them as a trade advantage for the sellers only."

The report said that the commission came in contact with ninety open price trade associations or groups in this

industry and found no outstanding general differences between open price and other types of trade associations.

## Reinforcing Steel

### Chicago Warehouse Takes 1300 Tons

WITH a warehouse for Montgomery Ward & Co. at Chicago requiring 1300 tons, awards reported during the week amounted to 3450 tons. New projects amounted to only 635 tons. Awards follow:

NEW YORK, 300 tons, subway section under Grand Concourse; from Lyons-Slatery Co., Inc., general contractor, to National Bridge Works.  
CHICAGO, 1300 tons, addition to warehouse of Montgomery Ward & Co., to Calumet Steel Co.  
CHICAGO, 800 tons, reinforcing mesh for Marshall Field & Co. warehouse, to an unnamed bidder.  
ST. PAUL, MINN., 200 tons, sewage work, to Kalman Steel Co.  
LOS ANGELES, 400 tons, apartment building at Ninth and Serrano Streets, to unnamed interest.  
LOS ANGELES, 350 tons, apartment building on Normandie Avenue, to unnamed bidder.  
SEATTLE, 100 tons, office building for Boeing Airplane Co., to Pacific Coast Steel Co.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

AKRON, OHIO, 200 tons, Ohio Bell Telephone Co. building.  
MILWAUKEE, 345 tons, United States Engineer office closed bids Feb. 14.  
SAN FRANCISCO, 190 tons, apartment building at Geary and Shannon Streets; bids being taken.

## Jeffrey Mfg. Co. Buys Galion Iron Works

The Jeffrey Mfg. Co., Columbus, Ohio, maker of mining machinery, conveying and handling equipment and electric locomotives, has purchased the entire capital stock of the Galion Iron Works & Mfg. Co., Galion, Ohio, maker of road machinery and equipment. The Galion company has also recently developed elevating and conveying equipment for handling coal, stone, gravel and other materials into central storage plants. The units of materials-handling equipment which can be more economically produced at the Jeffrey plant at Columbus will be concentrated there, allowing additional space at Galion for specialized road machinery. The new officers of the Galion company are D. C. Boyd, chairman of the board; Robert W. Gillispie, who is also vice-president and general manager of the Jeffrey company, president and general manager; J. S. Boyd, vice-president, and F. W. Faber, secretary and treasurer.

## St. Louis

### Heavy Shipments of Pig Iron But Buying Is Light—Scrap Prices Are Generally Higher

ST. LOUIS, Feb. 11.—Sales of pig iron for second quarter delivery continue light. However, shipments of both Southern and Northern iron are increasing and exceed the make. Melters are busy and are pressing the furnaces to ship promptly, which indicates that stocks in hands of consumers are low and that prospects are bright for a buying movement soon for second quarter. Makers are making no strenuous efforts to sell. Prices are firm. The St. Louis Gas & Coke Corporation sold 3750 tons during the week, of which all but 300 tons was for second quarter delivery. Sales included 2000 tons of foundry iron to a radiator manufacturer and 1100 tons of malleable to a local melter.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	20.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Coke.**—The demand for domestic coke from Eastern centers continues the outstanding feature of this commodity. A by-product concern is shipping about 40 carloads daily to one market. Furnace coke also is in big demand. Foundry coke also is moving well.

**Finished Iron and Steel.**—The principal transaction of the week was the award of 2000 tons of steel for the Continental Life Insurance Building to the Mississippi Valley Structural Steel Co. The Terminal Railway Association bought 1200 kegs of track spikes from the Scullin Steel Co. The market for plates, shapes and bars is very firm, and prices are being maintained. The sheet market is firm.

#### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.95c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.15c.
Galv. corrug. sheets	5.00c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
Per Cent Off List	
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

**Old Material.**—The scrap situation has been made tighter by the inability of railroads to deliver material that has been sold to dealers, the cold weather making it impossible to load the scrap. High prices in other markets and an expanding export demand have also made it difficult to get material here. Mills are willing to buy, but their prices are said to be unsatisfactory to dealers. Prices generally are higher. Heavy melting steel is up 75c. a ton; machine shop turnings and steel car axles are \$1 higher; and other items have advanced 25c. to 50c. a ton. Cast iron borings are off 75c. a ton on account of a decline in Chicago market. Railroad lists which are light, include: Southern Pacific, 2270 tons; Wabash, 1932 tons; Texas & Pacific, 1700 tons; Missouri-Kansas-Texas, 1500 tons; Kansas City Southern, 164 tons;

Great Northern, 56 carloads; Nickel Plate, 23 carloads; Frisco Lines, 19 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	\$14.25 to \$14.75
No. 2 heavy melting or shoveling steel	13.75 to 14.25
No. 1 locomotive tires	15.00 to 15.50
Miscel. stand.-sec. rails including frogs, switches and guards, cut apart	16.00 to 16.50
Railroad springs	17.50 to 18.00
Bundled sheets	10.00 to 10.50
No. 2 railroad wrought	14.50 to 15.00
No. 1 busheling	10.50 to 11.00
Cast iron borings and shoveling turnings	9.75 to 10.25
Iron rails	15.00 to 15.50
Rails for rolling	16.50 to 17.00
Machine shop turnings	10.00 to 10.50
Heavy turnings	10.25 to 10.75
Steel car axles	21.00 to 21.50
Iron car axles	23.00 to 23.50
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought	15.00 to 15.50
Steel rails, less than 3 ft.	17.00 to 17.50
Steel angle bars	15.50 to 16.00
Cast iron carwheels	15.50 to 16.00
No. 1 machinery cast	16.00 to 16.50
Railroad malleable	16.50 to 17.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	13.25 to 13.75
Agricult. malleable	14.00 to 14.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

## Boston

### Pig Iron Sales Larger While Those of Old Material Fall Off—Scrap Prices Easier

BOSTON, Feb. 11.—Another slight gain was made the past week in pig iron sales, more than 7000 tons having been booked, against 6000 tons the previous week. Sales included 1200 tons of No. 2X and No. 1 to the Universal Winding Co., Providence, R. I. A New York State furnace is reported to have sold the No. 2X at \$18.50 a ton, on cars furnace, and a Buffalo stack the No. 1 at \$18 a ton, Buffalo, or the equivalent of \$17, after allowing silicon differentials. A Connecticut foundry took 1000 tons low phosphorus Mystic iron. Other sales included one 1000-ton lot No. 2X and No. 1; another 1000-ton lot of two grades; at least three 500-ton lots No. 1 and No. 2X; and smaller lots ranging down to car lots. Most iron bought was for deliveries running into and for second quarter delivery. No Buffalo district iron for rail and water shipment has been sold, presumably because of higher barge rates this season. The Rhode Island Malleable Co. is in the market for 400 to 500 tons of malleable, and possibly will buy a larger amount.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	\$21.91 to \$22.91
*Buffalo, sil. 2.25 to 2.75	22.41 to 23.41
East. Penn., sil. 1.75 to 2.25	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Va., sil. 1.75 to 2.25	25.91
Va., sil. 2.25 to 2.75	27.41
Ala., sil. 1.75 to 2.25	23.41 to 25.77
Ala., sil. 2.25 to 2.75	23.91 to 26.27

Freight rates: \$4.91 all rail from Buffalo; \$3.65 from eastern Pennsylvania; \$5.21 all rail from Virginia; \$6.91 to \$8.77 from Alabama.

\*All rail rate.

**Coke.**—Sales of by-product foundry and domestic coke are holding up well, with indications that February ship-

ments will be larger than those of January. Foundry coke is still \$11 a ton, delivered within a \$3.10 freight rate zone.

**Imports.**—January imports of pig iron at this port were 1525 tons, contrasted with 1771 in December and 1378 in January, last year. Imports of ore were 14,900 tons, against 5300 tons in December and none in January, last year.

**Warehouse Business.**—February deliveries of iron and steel products by

#### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex.	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
Per Cent Off List	
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

\*Including quantity differentials.

warehouses here have exceeded those of January. Warehouses, except in a few cases, are securing full list prices.

**Old Material.**—Business closed by local brokers the past week disclosed a rather pronounced falling off, especially from the Pittsburgh district. Current shipments are very largely confined to eastern Pennsylvania mills and to New England consumers. Shipments of forge flashings have been larger than of any other grade of material, and the market is a shade firmer. Cast iron borings for steel works and rolling mill use are selling most frequently at \$6.50 a ton, on cars shipping point. Owing to a delay in arriving from abroad, a steamer to take 5300 tons of scrap to Danzig will finish loading about March 10, instead of Feb. 15, as previously an-

nounced. Exporters are paying \$10.25 to \$10.50 a ton, on dock here, for steel scrap.

*Buying prices per gross ton f.o.b. Boston rate shipping points:*

No. 1 heavy melting steel	\$12.25 to \$12.75
Scrap T rails	12.00 to 12.50
Scrap girder rails	11.25 to 11.75
No. 1 railroad wrought	11.00 to 11.50
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	6.50 to 7.00
Cast iron borings (steel works and rolling mill)	6.50 to 7.00
Bundled skeleton, long	9.50 to 10.00
Forge flashings	10.00 to 10.50
Blast furnace borings and turnings	6.00 to 6.50
Forge scrap	8.50 to 9.50
Shafting	14.00 to 14.50
Steel car axles	17.00 to 17.50
Wrought pipe 1 in. in diameter (over 2 ft. long)	11.00 to 11.50
Rails for rolling	12.50 to 13.00
Cast iron borings, chemical	10.25 to 10.50
<i>Prices per gross ton deliv'd consumers' yards:</i>	
Textile cast	\$14.50 to \$15.00
No. 1 machinery cast	16.00 to 16.50
No. 2 machinery cast	14.00 to 14.50
Stove plate	11.00 to 11.50
Railroad malleable	16.50 to 17.00

## Buffalo

### Foundry Iron Firm in the District—Steel Mills Continue Heavy Operations—Scrap Easier

BUFFALO, Feb. 11.—The market remains quiet, but producers expect a second quarter buying movement soon. At this writing the Massey-Harris Co. has not placed its orders for 5000 tons of malleable and No. 2 plain foundry required for Toronto and Batavia. Prices are firm for delivery in this immediate district, and it is stated that even on a large inquiry \$18.50, base, would not be shaded. This price has been obtained recently on small lots. Foundry melt is good, and the foundries are living up to their contracts so well that the furnace interests say they have seldom seen such a free movement of iron at this time of year.

*Prices per gross ton, f.o.b. furnace:*

No. 2 fdy., sil. 1.75 to 2.25	\$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

**Finished Iron and Steel.**—Local mill operation has not diminished from the high point of 85 to 90 per cent mentioned last week. Inquiry for bars, shapes and sheets is steady. An especially good business is being done in automobile body sheets. Reinforcing bar demand is better, though few sizable jobs are being figured.

**Old Material.**—The market is softer. There has been no heavy buying throughout the past week, though the largest consumer is expected in the market any day. No. 1 heavy melting steel is being freely offered at

\$18, and it is probable that it could be had for 50c. less. The holding up of shipments at Youngstown has caused a temporary surplus here. Prices of most of the commodities being shipped there are off 50c. to 75c. a ton. Machine shop turnings are weaker on this account, coupled with the fact that a large Detroit plant has recently placed about 20,000 tons of this material on the market. A good demand exists for No. 1 cast scrap, \$16.50 and \$17 having been paid. Cast iron borings are quite scarce and some of the dealers have had to pay \$12 to fill old orders at \$11.50. Hydraulic compressed is coming out freely. Knuckles and couplers have been sold at \$19 to \$19.50, and there have been some sales of 2-ft. rails at \$20 and some 3-ft. rails at \$19.50.

*Prices per gross ton, f.o.b. Buffalo consumers' plants:*

<i>Basic Open-Hearth Grades</i>	
No. 1 heavy melting steel	\$17.50 to \$18.00
No. 2 heavy melting steel	14.25 to 14.50
Scrap rails	16.50 to 17.00
Hydraul. comp. sheets	15.00 to 15.25
Hand bundled sheets	12.00 to 12.50
Drop forge flashings	14.00 to 14.50
No. 1 busheling	16.50 to 17.00
Hvy. steel axle turnings	14.00 to 14.50
Machine shop turnings	7.50 to 8.00
No. 1 railroad wrought	13.50 to 14.00
<i>Acid Open-Hearth</i>	
Knuckles and couplers	19.00 to 19.50
Coil and leaf springs	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Low phos. billet and bloom ends	20.00 to 20.50
<i>Electric Furnace Grades</i>	
Short shov. steel turnings	13.50 to 14.00
<i>Blast Furnace Grades</i>	
Short mixed borings and turnings	11.50 to 12.50
Cast iron borings	12.00 to 12.50
No. 2 busheling	10.00 to 10.50
<i>Rolling Mill Grades</i>	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
<i>Cupola Grades</i>	
No. 1 machinery cast	16.50 to 17.00
Stove plate	14.50 to 15.00
Locomotive grate bars	13.50 to 14.00
Steel rails, 3 ft. and under	19.50 to 20.00
Cast iron carwheels	14.00 to 14.50
<i>Malleable Grades</i>	
Industrial	18.00 to 18.50
Railroad	18.00 to 18.50
Agricultural	18.00 to 18.50

### Warehouse Prices, f.o.b. Buffalo

<i>Base per Lb.</i>	
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	\$3.60
Black wire, base per 100 lb.	3.75

## Birmingham

### Steel Mills Getting Good Volume of Business

BIRMINGHAM, Feb. 11.—Shipments of pig iron are better than the January average. Sales consist largely of fill-in tonnages. Prices remain at \$16.50 to \$17 for No. 2 foundry. The No. 2 Woodward furnace of the Woodward Iron Co., which was blown out on Jan. 23 for repairs, was put back in operation on Feb. 8. The No. 2 Ensley furnace of the Tennessee company was banked on Feb. 2. Of the 17 furnaces in blast, nine are on foundry, seven on basic and one on recarburizing iron.

*Prices per gross ton, f.o.b. Birmingham dist. furnaces:*

No. 2 fdy., 1.75 to 2.25 sil.	\$16.50 to \$17.00
No. 1 fdy., 2.25 to 2.75 sil.	17.00 to 17.50
Basic	16.50

**Finished Steel.**—New business and specifications on contracts are running ahead of the total at this time last year. Sheet sales are holding up well at a period when there is usually a let up in this district. The Tennessee company has booked an order for 10,000 tons of steel rails for the Southern Pacific Railroad. The Virginia Bridge & Iron Co. has booked 450 tons for the Louisville & Nashville Railroad warehouse at Pensacola, Fla. Operations of reinforcing bar plants are well supported by small orders, and the immediate outlook is favorable. The Tennessee company is working seven or eight open-hearth at Ensley and six at Fairfield, one less than last week. The Gulf States Steel Co. is operating four at Alabama City, a reduction of one.

**Cast Iron Pipe.**—The United States Cast Iron Pipe & Foundry Co. has an order for 2900 tons for Detroit. New orders of the McWane Cast Iron Pipe Co. include 225 tons for Manchester, N. H.; 200 tons for Madison, N. J.; 130 tons for Okanogan, Wash., and 150 tons for New Harmony, Ind. Plants in the district have bids in on several fair-sized orders for Pacific Coast cities. Winter buying by municipalities has been slower this year than usual. This has been offset somewhat by good business from private interests. Quotations are unchanged, with \$37 to \$38 the quotations on 6-in. and larger sizes.

**Old Material.**—Demand has been light and buying spotty during the past week. The larger consumers have heavy stocks. Quotations are unchanged, but prices show some unsteadiness.

*Prices per gross ton, deliv'd Birmingham dist. consumers' yards:*

Heavy melting steel	\$12.50
Scrap steel rails	\$12.00 to 12.50
Short shoveling turnings	9.00
Cast iron borings	8.00
Stove plate	13.50
Steel axles	20.00
Iron axles	22.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	15.00
Tramcar wheels	13.00 to 14.00
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem.	13.50 to 14.00

## Cincinnati

### Coke Demand Heavy—Scrap Prices Easier on Smaller Activity—Pig Iron Quiet

CINCINNATI, Feb. 11.—With pig iron consumers covered through the first quarter and with the price situation offering little incentive to buyers to contract for second quarter needs, the market is quiet. The Marmon Motor Car Co., Indianapolis, has purchased about 2250 tons of iron from a furnace in the Chicago district and is reported to have paid somewhat less than the regular schedule. Another Indiana melter has closed for 500 tons of Northern foundry, which will be furnished by a Lake Erie producer. The only important inquiry is for 1300 tons of foundry for the Lunkenheimer Co., Cincinnati. A Cleveland steel company is reported to have sold all its merchant iron through the first half of the year and another seller at Cleveland is said to be quoting \$19, base furnace, for shipment into this territory. Little Southern iron is moving north of the Ohio River, but prices are firm at \$16.50, Birmingham. The Martins Ferry furnace of the Wheeling Steel Corporation now is shipping foundry and malleable iron by water to Ohio River points. Sales by Jackson County silvery iron makers have been light and the schedule is unchanged at \$26, furnace, for 8 per cent.

Prices per gross ton, deliv'd Cincinnati:  
So. Ohio fdy., sil. 1.75 to 2.25  
Ala. fdy., sil. 1.75 to 2.25... \$20.39 to \$20.89  
Ala. fdy., sil. 2.25 to 2.75... 20.19 to 20.69  
Tenn. fdy., sil. 1.75 to 2.25... 20.69 to 21.19  
S'th'n Ohio silvery, 8 per cent... 27.89 to 28.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

**Coke.**—The by-product coke market has gained additional strength in the past week, with a shortage of stock for spot shipment developing in foundry as well as in domestic grades. Especially in Michigan are specifications and orders heavy. In foundry coke, the heavy consumption is accounted for by the substantial demand from automobile foundries and by the inroads which have been made on the normal volume of output by increased production of domestic coke. Prices are unchanged.

#### Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinfrc. bars.....	3.15c.
Rail steel reinfrc. bars.....	3.00c.
Hoops.....	4.05c.
Bands.....	3.50c.
Cold-fin. rounds and hex.....	3.85c.
Squares.....	4.35c.
Black sheets (No. 24).....	3.90c.
Galvanized sheets (No. 24).....	4.75c.
Blue ann'l'd sheets (No. 10).....	3.45c.
Structural rivets.....	3.85c.
Small rivets.....	.65 per cent off list
No. 9 ann'l'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg.....	2.95
Cement c't'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap-weld, steel boiler tubes, 2-in.....	\$16.00
4-in.....	\$3.00
Seamless steel boiler tubes, 2-in.....	17.00
4-in.....	34.00

**Old Material.**—Heavy melting steel, cast iron borings and machine shop turnings are off 25c. a ton, while a few other items have dropped from 25c. to 50c. Dealers are buying conservatively. District steel plants are reported to be deferring purchases in the belief that they will be able to buy at less money a few weeks hence. The Louisville & Nashville and the Southern have moderate-sized lists closing this week.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$13.75 to \$14.25
Scrap rails for melting.....	13.75 to 14.25
Loose sheet clippings.....	10.25 to 10.75
Bundled sheets.....	11.00 to 11.50
Cast iron borings.....	10.00 to 10.50
Machine shop turnings.....	9.50 to 10.00
No. 1 busheling.....	11.00 to 11.50
No. 2 busheling.....	7.50 to 8.00
Rails for rolling.....	14.50 to 15.00
No. 1 locomotive tires.....	14.25 to 14.75
No. 2 railroad wrought.....	13.75 to 14.25
Short rails.....	19.00 to 19.50
Cast iron carwheels.....	12.75 to 13.25
No. 1 machinery cast.....	19.25 to 19.75
No. 1 railroad cast.....	15.25 to 15.75
Burnt cast.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Brake shoes.....	10.50 to 11.00
Railroad malleable.....	15.25 to 15.75
Agricultural malleable.....	14.25 to 14.75

## Pacific Coast

### Demand for Steel Products Fairly Active

SAN FRANCISCO, Feb. 9 (*By Air Mail*).—Trading in iron and steel products on the Pacific Coast is well maintained, with plates and cast iron pipe most in demand. Outstanding awards of the week included 1000 tons of structural shapes for a saw mill at Alturas, Cal., placed with Worden-Allen Co., and 400 tons of reinforcing steel bars for an apartment building in Los Angeles, booked by an unnamed interest.

**Pig Iron.**—The Columbia Steel Corporation was awarded 256 tons of foundry iron for the Mare Island and Puget Sound navy yards.

Prices per gross ton at San Francisco:

*Utah basic.....	\$25.00 to \$26.00
*Utah fdy., sil. 2.75 to 3.25.....	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25.....	24.00 to 25.00

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

**Bars.**—Among the larger awards of reinforcing steel bars were 350 tons for an apartment building in Los Angeles and 100 tons for an office building in Seattle for the Boeing Airplane Co. Pending business involves a fair-sized tonnage, though mostly in small lots. Bids are being taken on 190 tons for an apartment building on Geary Street, San Francisco. Out-of-stock prices on reinforcing bars now appear firm at 2.20c., base, on carload lots in the Los Angeles and San Francisco districts, with 2.60c. applying on less than carload lots. Merchant bars are firm at 2.30c., c.i.f. Coast ports.

**Plates.**—The only award of importance this week was 104 tons of 30-in. riveted steel pipe for Glendale, Cal., which went to the Lacy Mfg. Co. Steel tanks for oil companies in the Los Angeles district will take upward of 4000 tons. Spokane, Wash., will shortly come into the market for 1970 tons of 36 and 48-in. welded steel pipe. Bids will be opened next week on 1512 tons for a 60-in. pipe line for the Denver Board of Water Commissioners. Prices appear to be firm at 2.25c., c.i.f., on the usual run of the market, though these figures are being shaded on the larger and more desirable lots.

**Shapes.**—The outstanding structural award of the week was 1000 tons for a saw mill for the Pickering Lumber Co. at Alturas, Cal., booked by the Worden-Allen Co. Other lettings included 150 tons for a school in Sacramento, Cal., taken by the Moore Dry Dock Co., and 100 tons for a plant in Seattle for the Kenworth Motor Truck Co., booked by Wallace Bridge & Structural Steel Co. Bids are now being taken on 250 tons for a warehouse and garage for the Western Electric Co., at Emeryville, Cal. Plain material continues firm at 2.35c., c.i.f.

**Cast Iron Pipe.**—The largest award of the week went to the Pacific Waterworks Supply Co., Seattle, and called for 169 tons of 4 and 6-in. Class B pipe for Toledo, Wash. Bids were opened this week on 2242 tons of 12-in. Classes A, B and C pipe for the Southern Pacific Co., San Francisco; on 1103 tons of 2 to 10-in. Class B pipe for the East Bay Municipal Utility District, Oakland, Cal., and on 119 tons of 8-in. Class B pipe for Eureka, Cal. New inquiries include 338 tons of 4 to 12-in. Class B pipe for Anaheim, Cal., bids on which will be opened Feb. 14, also 219 tons of 6 to 16-in. Classes B and C pipe for the improvement of Thirty-sixth Avenue S. W., Seattle. Pending business exceeds 8500 tons.

**Railroad Material.**—The Southern Pacific Co., San Francisco, has taken bids on 3500 kegs of track spikes and 1000 kegs of track bolts and will shortly come into the market for about 20,000 kegs of track spikes and 5000 kegs of track bolts.

**Sheets.**—The Highway Department, Washington, has opened bids on 142 tons of black sheets for 1930 license plates. A call for bids for the California license plates for 1930 will be issued shortly.

#### Warehouse Prices, f.o.b. San Francisco

Base per Lb.	
Plates and struc. shapes.....	3.15c.
Soft steel bars.....	3.15c.
Small angles, 1/2-in. and over.....	3.15c.
Small angles, under 1/2-in.....	3.55c.
Small channels and tees, 1/2-in. to 2 1/2-in.....	3.75c.
Spring steel, 1/2-in. and thicker.....	5.00c.
Black sheets (No. 24).....	4.90c.
Blue ann'l'd sheets (No. 10).....	3.80c.
Galv. sheets (No. 24).....	5.30c.
Struc. rivets, 1/2-in. and larger.....	5.65c.
Com. wire nails, base per keg.....	\$3.40
Cement c't'd nails, 100 lb. keg.....	3.40

# Non-Ferrous Metal Markets

## Copper Again Advanced But Now Quiet, Tin Sales Moderate at Steady Levels, Lead Quotations Higher, Zinc Unchanged

NEW YORK, Feb. 11.

**Copper.**—Two more advances in as many days took place in electrolytic copper in the last week. On Wednesday, Feb. 6, the market reached 17.75c., delivered in the Connecticut Valley, and on Friday, Feb. 8, the 18c. level was attained. Again these advances were induced by heavy buying by both foreign and domestic consumers, particularly the foreign. Sales thus far in February for export have been over 30,000 gross tons, and for domestic delivery 40,000 tons or more. Accompanying the advances in the domestic market

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY					
	Feb. 11	Feb. 9	Feb. 8	Feb. 7	Feb. 6
Lake copper, New York.....	18.12½	18.00	18.00	17.87½	17.87½
Electrolytic copper, N. Y.....	17.75	17.75	17.75	17.50	17.50
Straits tin, spot, N. Y.....	49.75	....	49.62½	49.62½	49.87½
Lead, New York.....	6.85	6.75	6.75	6.75	6.75
Lead, St. Louis.....	6.72½	6.62½	6.62½	6.62½	6.62½
Zinc, New York.....	6.70	6.70	6.70	6.70	6.70
Zinc, St. Louis.....	6.35	6.35	6.35	6.35	6.35

\*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

there were also two by Copper Exporters, Inc., lifting the price to 18.25c., c.i.f. European ports. There were also advances in the Lake copper market, which now stands at 18c. to 18.12½c., delivered. The 18c. price for electrolytic is the highest since 1920. The two advances last week make eight successive ones in six weeks. Partly because of the holiday tomorrow and partly because the trade is waiting to digest the January statistics, which will be made public Feb. 18, conditions are more tranquil and buying has let up. Predictions of higher prices are not so frequent, and it is thought present levels will be maintained for some days at least, if not longer. Domestic consumers

have covered for most of their requirements through May and are inquiring for June delivery, for which position a few sales have been made. Foreign consumers are pretty well covered through April, and some have purchased May metal at a premium of about \$1 a ton.

**Tin.**—Again sales of Straits tin for the week ended Feb. 9 were below 1000 tons, the estimated quantity being about 800 tons. Consumers were the principal buyers, dealers remaining inactive. On the National Metal Exchange the heavy day was Feb. 5 with 625 tons of standard tin sold, business having been light on other days. Such purchases as consumers have made have been prin-

### Metals from New York Warehouse

#### Delivered Prices Per Lb.

Tin, Straits pig.....	52.00c. to 53.00c.
Tin, bar.....	54.00c. to 55.00c.
Copper, Lake.....	19.25c.
Copper, electrolytic.....	19.00c.
Copper, casting.....	18.75c.
Zinc, slab.....	7.50c. to 8.00c.
Lead, American pig.....	7.50c. to 8.00c.
Lead, bar.....	9.50c. to 10.00c.
Antimony, Asiatic.....	12.00c. to 13.00c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy.....	24.00c. to 25.00c.
Babbitt metal, commerc'l grade.....	30.00c. to 40.00c.
Solder, ½ and ½.....	33.00c. to 34.00c.

### Metals from Cleveland Warehouse

#### Delivered Prices Per Lb.

Tin, Straits pig.....	54.75c.
Tin, bar.....	56.75c.
Copper, Lake.....	18.38c.
Copper, electrolytic.....	18.38c.
Copper, casting.....	18.00c.
Zinc, slab.....	8.00c.
Lead, American pig.....	7.25c. to 7.40c.
Lead, bar.....	9.75c.
Antimony, Asiatic.....	16.00c.
Babbitt metal, medium grade.....	19.25c.
Babbitt metal, high grade.....	60.25c.
Solder, ½ and ½.....	34.00c.

### Rolled Metals from New York or Cleveland Warehouse

#### Delivered Prices, Base Per Lb.

<b>Sheets—</b>	
High brass.....	21.62½c.
Copper, hot rolled.....	26.37½c.
Copper, cold rolled, 14 oz. and heavier.....	27.62½c.
<b>Seamless Tubes—</b>	
Brass.....	26.50c.
Copper.....	27.37½c.
Brazed Brass Tubes.....	29.62½c.
Brass Rods.....	19.37½c.

#### From New York Warehouse

#### Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	10.00c. to 10.50c.
Zinc sheets, open.....	11.00c. to 11.50c.

## Non-Ferrous Rolled Products

Mill prices on all bronze, brass and copper products were advanced ¼c. on Feb. 5, and a further increase of ½c. on copper sheets and copper in rolls and of ½c. on seamless copper tubing, copper wire and all brass products was made effective Feb. 8. Prices on zinc sheets and lead full sheets are unchanged.

### List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass.....	22.56c.
Copper, hot rolled.....	27.37½c.
Zinc.....	9.75c.
Lead (full sheets).....	10.50c. to 10.75c.
<b>Seamless Tubes—</b>	
High brass.....	27.37½c.
Copper.....	28.37½c.

<b>Rods—</b>	
High brass.....	20.25c.
Naval brass.....	22.25c.
<b>Wire—</b>	
Copper.....	19.37½c.
High brass.....	23.00c.
Copper in Rolls.....	26.37½c.
Brazed Brass Tubing.....	30.50c.

### Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

<b>Sheets, 0 to 10 gage, 3 to 30 in. wide.....</b>		33.00c.
<b>Tubes, base.....</b>		42.00c.
<b>Machine rods.....</b>		34.00c.

## Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	14.75c.	16.00c.
Copper, hvy. and wire.....	14.25c.	15.50c.
Copper, light and bottoms.....	12.25c.	13.75c.
Brass, heavy.....	7.75c.	9.00c.
Brass, light.....	6.75c.	7.75c.
Hvy. machine composition.....	11.00c.	12.50c.
No. 1 yel. brass turnings.....	9.50c.	10.25c.
No. 1 red brass or compos. turnings.....	10.75c.	11.50c.
Lead, heavy.....	5.25c.	5.75c.
Lead, tea.....	3.75c.	4.25c.
Zinc.....	3.25c.	3.75c.
Sheet aluminum.....	13.50c.	15.50c.
Cast aluminum.....	12.00c.	14.00c.

## Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

<b>Sheets—</b>		Base per Lb.
High brass.....	22.50c.	
Copper, hot rolled.....	27.62½c.	
Copper, cold rolled, 14 oz. and heavier.....	29.32½c.	
Zinc.....	10.00c.	
Lead, wide.....	10.55c.	
<b>Seamless Tubes—</b>		
Brass.....	27.37½c.	
Copper.....	28.37½c.	
Brass Rods.....	20.25c.	
Brazed Brass Tubes.....	30.50c.	

cipally for February-March with a little for April. They have consistently neglected futures and on bulges have been shy. This seems to indicate scant faith in prevailing price levels. These conditions make for a large cumulative buying power which will be felt later. The market today, preceding the holiday, has been quiet both for Straits and standard, with spot Straits tin quoted at 49.75c., duty paid, New York. Quotations in London today were lower than last Tuesday by £3 to £4 per ton, with spot standard quoted at £224 7s. 6d., future standard at £225 10s. and spot Straits at £231 7s. 6d. The Singapore market today was closed because of the celebration of the Chinese new year in the Far East.

**Lead.**—Two advances have been made by the American Smelting & Refining Co. during the last week. On Feb. 6 its contract quotation was advanced to 6.75c. from 6.65c. and early today from 6.75c. to 6.85c., New York. Sympathetically, values at St. Louis are also higher, standing today at 6.72½c. to 6.75c., with sales at both levels. Buying by consumers has been heavy almost every day, principally for prompt and March metal, with some sales for April delivery. The London market has also been advancing, being quoted today 3s. 9d. per ton higher than on Saturday.

**Zinc.**—Business in prime Western is light and prices are firm at 6.35c., East St. Louis, or 6.70c., New York, for nearby and March delivery. A little metal is reported available at 6.32½c., East St. Louis. The price of ore was again unchanged at the end of last week, Feb. 9, at \$40, Joplin, and transactions for the week were such as to change little the stocks on hand, which were around 22,000 tons, or less than two weeks' supply.

**Antimony.**—Chinese metal is quoted today at 9.62½c. to 9.75c., duty paid, New York, for all positions. The market is quiet and cables from China are absent because of the Chinese new year celebration.

**Nickel.**—Wholesale lots of ingot and shot nickel are quoted at 35c. and 36c. per lb. respectively. Cathodes of electrolytic nickel are obtainable on the same basis as ingot and shot nickel.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is obtainable at 23.90c. per lb., delivered.

#### Non-Ferrous Metals at Chicago

CHICAGO, Feb. 11.—Demand for copper, tin and lead is active and prices are higher. Sales in the old metal market are numerous and prices for the copper grades are advanced.

**Prices, per lb., in carload lots:** Lake copper, 17.87½c.; tin, 50.25c.; lead, 6.80c.; zinc, 6.45c.; in less-than-carload lots: antimony, 10.50c. On old metals we quote copper wire, crucible shapes and copper clips, 14.50c.; copper bottoms, 13c.; red brass, 12.75c.; yellow brass, 9.50c.; lead pipe, 5.50c.; zinc, 3.50c.; pewter, No. 1, 27.50c.; tin foil, 27.50c.; block

tin, 40c.; aluminum, 12.75c.; all being dealers' prices for less-than-carload lots.

## Railroad Equipment

### Illinois Central Orders 2900 Freight Cars

**F**REIGHT cars ordered during the last week totaled more than 4300, of which 2900 were bought by the Illinois Central and 675 by the Texas Co. The Northern Pacific is inquiring for 500 gondola cars. Details of the week's business follow:

Pere Marquette has made appropriations for purchase of 10 switch engines, five Mikado-type locomotives and 100 all-steel hopper cars. These are in addition to 1400 freight cars placed recently.

Southern Pacific is inquiring for 16 Mallet-type locomotives.

Chicago, Milwaukee, St. Paul & Pacific is expected to make inquiry soon for 15 caboose cars and 10 passenger coaches.

Louisville & Nashville has placed six baggage cars with Pressed Steel Car Co., in addition to 12 cars placed last week.

Texas Co. has ordered 300 10,000-gal. tank cars from Petroleum Iron Works, and 300 10,000-gal. tank and 75 12,000-gal. tank cars from American Car & Foundry Co.

Elgin, Joliet & Eastern has ordered 125 gondola cars from Pressed Steel Car Co. and like number from American Car & Foundry Co.

Pickands, Mather & Co., Cleveland, have ordered two eight-wheel switching locomotives from Baldwin Locomotive Works.

Weyerhaeuser Timber Co. has ordered three 2-6-6-2-type and one 2-8-8-2-type locomotives from Baldwin Locomotive Works.

Chesapeake & Ohio has ordered 15 eight-wheel switching locomotives from Baldwin Locomotive Works.

Illinois Terminal Railroad is building five Class O and four Class C locomotives in its own shops.

Atchison, Topeka & Santa Fe has

ordered 200 flat cars from American Car & Foundry Co.

Bradford Corporation will build 100 center constructions in its own shops.

Chesapeake & Ohio is asking for bids on replacing new bodies on 577 70-ton hopper cars and repairs to trucks.

Illinois Central has ordered 700 automobile cars from American Car & Foundry Co., 300 automobile cars from Mount Vernon Car Mfg. Co., 750 gondola cars from Pullman Car & Mfg. Corporation, 100 gondola cars from Ryan Car Co., 425 hopper cars from Standard Steel Car Co., 425 hopper cars from General American Car Co., and 200 flat cars from Bettendorf Co.

Chicago & Illinois Western has purchased 100 hopper cars from General American Car Co. and 100 gondola cars from Ryan Car Co.

Northern Pacific is in market for 500 automobile cars, in addition to recent inquiry for 500 gondola cars.

Western Pacific will buy five 2-8-2 type locomotives.

## Chase Rod and Sheet Mill at Cleveland

The Chase Brass & Copper Co. has under construction at Cleveland, a rod and sheet mill, the first unit of its mid-Western plant. The main plant of the Chase company is located at Waterbury, Conn.

The new Chase plant, which will represent an ultimate investment within a few years of over \$6,000,000, is located in Euclid, Ohio, a suburb of Cleveland, directly east of Babbitt Road, between the New York Central and Nickel Plate Railroads, on a tract of land of 60 acres. Option has been obtained on 40 additional acres.

The plant unit now being built can be expanded in three directions. The main building is 225 ft. wide and 1000 ft. long. There are three aisles running longitudinally in the building, each approximately 75 ft. wide. Each of these aisles is supplied with a 10-ton traveling crane with a 70 ft. clear span. Steel columns are spaced 75 ft. apart transversely and 40 ft. longitudinally. Cement tile slab is being used on the roof, indicating the fireproof construction embodied in this plant. The walls are to be of brick and steel sash construction.

The entire plant is of one story, except for a basement under the casting department. There is a tunnel under the entire length of the building to contain all service pipe lines. The roof construction of the main building is of sawtooth design, each tooth being a 40 ft. span. A large portion of the floor is 3-in. wood block with concrete base. In the first unit are 3000 tons of structural steel and 100,000 sq. ft. of steel sash and glass.

A complete power plant will be located in a separate building to provide heat and power. A water line will be run from Lake Erie—two miles distant—to provide the large quantity of water necessary for manufacturing operations.

The Austin Co. designed and is building the new Chase plant. It is expected that the new unit will be finished in time to permit the owners to start production about mid-summer.

## COMING MEETINGS

### February

**Midwestern Engineering and Power Exposition.** Feb. 12 to 16. Exposition at Coliseum, and power conference at Palmer House, Chicago. G. E. Pfisterer, 53 West Jackson Boulevard, Chicago, secretary.

**Machinery and Equipment Conference.** Feb. 14. Third conference of representatives of machinery and equipment associations, Chamber of Commerce Building, Washington. Philip P. Gott, secretary.

**Eastern States Blast Furnace and Coke Oven Association.** Feb. 15. Midwinter meeting, William Penn Hotel, Pittsburgh. James E. Lose, Homestead Works, Carnegie Steel Co., secretary.

**American Institute of Mining and Metallurgical Engineers.** Feb. 18 to 22. Annual convention, 29 West Thirty-ninth Street, New York. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

**American Management Association.** Feb. 27 to March 1. Production executives division, William Penn Hotel, Pittsburgh. W. J. Donald, 20 Vesey Street, New York, managing director.

## PERSONAL

A. H. JAMESON, sales manager of the Deemer Steel Casting Co., New Castle, Del., has severed his connection with that company and on March 15 will become manager of castings sales for the Malleable Iron Fittings Co., Branford, Conn. Mr. Jameson has been five years with the Deemer company and during the preceding five years he was vice-president and general manager of the Bayonne Steel Casting Co., Bayonne, N. J. For the 12 years preceding that he was manager of the steel department of the Branford company with which he is soon to become again associated. Mr. Jameson is very active in some of the committees of the American Foundrymen's Association and the American Society for Testing Materials.

JOHN A. TOPPING, chairman Republic Iron & Steel Co., New York, will leave Feb. 15 for a few weeks' sojourn at Nassau, B. W. I.

DR. KOTARO HONDA, head of the metallurgical research institute of the Japanese Imperial University, is touring the United States, visiting physical and metallurgical laboratories and various steel working and fabricating plants.

EDWARD P. WELLES, president Charles H. Besly & Co., Chicago, recently sailed from New York on the steamship Rotterdam for a 60-day Mediterranean cruise.

J. B. DEISHER, foundry consultant, Rochester, N. Y., has been engaged by the Malleable Iron Research Institute in the capacity of shop practice engineer and will devote all of his time in the future to Malleable Institute activities. Prior to his work as an independent foundry consultant, he was for 14 years connected with the Symington Co., Rochester, N. Y., and for 3½ years, served the American Malleable Castings Association and Malleable Iron Research Institute as assistant to the consulting engineer. In 1927 he was sent to Europe by the American Radiator Co., as consulting engineer in its malleable plant located in a suburb of Paris. He was one of the pioneers in the first successful application of pulverized coal to the air furnace for melting malleable iron and has since had an active part in the development of this method of firing. Mr. Deisher also represents the American Foundrymen's Association, for the malleable industry, on an advisory committee to the Bureau of Standards.

E. P. BURRELL, director of engineering for the Warner & Swasey Co., Cleveland, will have charge of the designing of the new 200-in. telescope to be built for the California

Institute of Technology, Pasadena, Cal. Mr. Burrell has been chiefly concerned with the technical problems of machine tools, but has become well known in the scientific world as a designer of telescopes. He will lay out machinery which will keep this telescope trained on a single star so that its microscopic rays will fall on the same spot on a photographic plate all night.

O. B. WILSON, for the last five years associated with the Brown Instrument Co., Philadelphia, has been placed in charge of the company's Cleveland office at 819 Hippodrome Building. His previous identification with the Brown organization has been in the New York and Philadelphia offices.

W. S. ROGERS, president of the Bantam Ball Bearing Co., Bantam, Conn., and one of the country's pioneer manufacturers of ball bearings, has sold his interest in that company and retired from active business. He began the manufacture of bearings more than 30 years ago and supplied many automobiles when that industry was in its inventive stage. Previously he was identified with the machine tool industry at Cincinnati and was also engaged at the Watervliet, N. Y., arsenal as a mechanical engineer designing 8, 10 and 12-in. guns for the army. MRS. NELLIE SCOTT ROGERS, for 25 years treasurer of the Bantam company, has also disposed of her interest and retired. She is one of the six women who are associate members of the American Society of Mechanical Engineers and is also a member of the Society of Automotive Engineers.

R. F. CREGO, formerly sales manager of the L. C. Smith Bearing Co., Chicago, has joined the sales organization of the Foote Brothers Gear & Machine Co., Chicago.

GEORGE M. HOLLEY, president of the Holley Carburetor Co., Detroit, has acquired a substantial interest in and been elected a director of the Kinner Airplane & Motor Corporation, 635 West Colorado Boulevard, Glendale, Cal. Mr. Holley is also president of the Towle Marine Airplane Co., and a director of the Stinson Aircraft Co., both of Detroit.

ARTHUR W. STEED has been appointed superintendent of the maintenance department at the Middletown, Ohio, plant, American Rolling Mill Co. He joined the company in 1915 as assistant superintendent of the power house, and was made superintendent of the power house in January, 1924. Later he was appointed combustion engineer, which position he held until his recent promotion. He is a member of the Association of

Iron and Steel Electrical Engineers, and the National Association of Stationary Engineers.

GUSTAVE KAHN, vice-president in charge of sales for the Truscon Steel Co., Youngstown, will retire from active business March 1. He joined the Truscon company three months after it was formed by his brothers, Julius and Albert Kahn, and for 25 years was continuously identified with the sales organization.

H. D. WILKINSON, formerly in the publishing field, is now a representative for the Liquid Metal Products Co., 231 South LaSalle Street, Chicago, producer and distributor of Stibloy, a rust-resisting coating for zinc products.

GEORGE S. EMERSON, treasurer Hampden Grinding Wheel Co., Springfield, Mass., and FRANK S. HATCH, assistant treasurer Moore Drop Forging Co., Springfield, have been elected directors of the Western Massachusetts Bank & Trust Co., of that city.

L. R. GRAVES, formerly assistant manager of the New England branch of the American Radiator Co., has been made manager of its Boston office. He has been associated with the company since 1910.

JOHN A. MATHEWS, vice-president of the Crucible Steel Co. of America, spoke on new alloy steels at a meeting of the Springfield, Mass., chapter of the American Society for Steel Treating on Feb. 12.

A. H. D'ARCAMBAL, consulting metallurgist Pratt & Whitney Co., Hartford, Conn., spoke on "Small Tools and Gages" at a meeting of the Providence Engineering Society, Providence, R. I., on Feb. 13.

LAWRENCE N. B. BULLOCK has been appointed representative in Mexico for the Wellman-Seaver-Morgan Co., Cleveland, maker of mining machinery and other equipment. His headquarters will be in Edificio Oliver, 16 de Septiembre, No. 5, Mexico City.

W. S. BIDLE, president of the W. S. Bidle Co., Cleveland, spoke on "Practical Heat Treatment," at a meeting of the Worcester, Mass., chapter of the American Society for Steel Treating, on Feb. 13.

W. H. BRAND, vice-president First Wisconsin Co., Milwaukee, has been elected a director of the Interstate Drop Forge Co., Milwaukee.

LEWIS KNAPP, industrial heat engineer for the Hartford Electric Light Co., Hartford, Conn., spoke before the Hartford chapter of the American Society for Steel Treating on Feb. 12, in connection with the showing of a motion picture illustrating several electric heat installations in the Hartford district.

H. J. BABCOCK, heating specialist of the General Electric Co., Cleveland, discussed heat treating furnace efficiencies and heat treating costs at a meeting of the Cincinnati chapter of the American Society for Steel Treating on Feb. 7.

W. A. MURPHY, purchasing agent Weirton Steel Co., Weirton, W. Va., has been made assistant secretary, and E. H. Kern, assistant purchasing agent, succeeds Mr. Murphy.

H. V. CRANFORD, industrial department, General Electric Co., Schenectady, N. Y., will speak on "Automatic Blast Gate Control for Cupolas" at the regular monthly meeting of the Pittsburgh Foundrymen's Association to be held at the Fort Pitt Hotel, Pittsburgh, on Monday evening, Feb. 18.

## Obituary

F. L. MUELLER, vice-president of the Advance Spring & Wire Co., Chicago, was killed in an automobile accident on Feb. 1. He was 29 years of age, and was the son of F. C. Mueller, president of the Advance company.

SAMUEL DEUTSCH, for 25 years a director of the Inland Steel Co., Chicago, died on Feb. 6. Prior to his retirement several years ago, he had served for 20 years as president of the Ohio Iron & Steel Co., Chicago, broker of scrap metals.

MICHAEL D. WALDRON, general superintendent of the plant of the Richardson & Boynton Co., Whitesboro, N. Y., died at his home in Utica, N. Y., on Feb. 4. He was born at Utica in 1868, and became well known for his inventions used in the heating trade. Before going with the Richardson & Boynton Co., he was general superintendent of the Utica Heater Co.

HARVEY A. CALL, of the research department of the Copper & Brass Research Association, New York, died on Feb. 8, after a brief illness. He was for many years editor and treasurer of *Sanitary and Heating Engineering*.

WALTER CLARK RUNYON, formerly president of the Struthers Furnace Co., Struthers, Ohio, and, prior to his retirement some years ago, prominently identified with the Lake Superior iron mining industry and pig iron manufacture in the Mahoning Valley, died in New York on Feb. 6. He was born at Chicago in 1857 and entered business with the Union Rolling Mill Co., Chicago, in 1871. In 1879 he became secretary of that company, but left it two years later to join J. B. Stubbs in the iron and steel commission business under the name of Stubbs & Runyon. He removed to Cleveland in 1886 to organize the firm of Runyon, Stubbs & Mack, iron ore commission dealers, and in 1894, en-

tered the blast furnace business. Two years later he purchased the Struthers Furnace Co. and in 1905, organized the Struthers Coal & Coke Co., having served as president of both companies for a number of years. He was one of the organizers and the first secretary of the Lake Superior Iron Ore Association and was also an organizer of the Bessemer Pig Iron Association. In the early days of the Lake Superior association he was chairman of the committee that worked out the table of phosphorus values which for many years was the basis for figuring prices of Bessemer ores of varying phosphorus content.

WILLIAM S. BUMBAUGH, founder and president of the Monessen Foundry & Machine Co., Monessen, Pa.,

died at his home at Belle Vernon, Pa., on Feb. 7. He was born at Morgantown, W. Va., 62 years ago.

RICHARD H. LIPPINCOTT, JR., a member of the firm of Dickerson, Van Dusen & Co., 99 John Street, New York, metal merchants, died in that city on Feb. 8, following an illness of three weeks. He was 42 years of age and a graduate of Princeton University. He became associated with Dickerson, Van Dusen & Co. in 1910, immediately after leaving college, and became a member of the firm in 1921. Mr. Lippincott was well known among the metal jobbers of the New York territory and at the time of his death was serving as president of the Metal Merchants' Credit Association of New York.

## Commission Amends Trade Practice Rules

### Self Government Resolutions of Woodworking Machinery Industry Changed to Suit Present Status

WASHINGTON, Feb. 11.—Consistent with its newly announced policy, the Federal Trade Commission has rejected the rule concerning distribution of current price lists adopted by the woodworking machinery industry at its trade practice conference held in Chicago on Dec. 12, 1928, under the auspices of the commission and conducted by Commissioner G. S. Ferguson, Jr. The commission first made known its changed position on this point last week when it issued a statement saying that it had rescinded previous action in receiving a similar rule adopted by the millwork industry. Evidently the commission did so after reaching the conclusion that to receive such a rule might be considered to run counter to Supreme Court decisions in the cement and maple flooring cases which held that circulation of prices as to past transactions was legal, thus implying that it is illegal to circulate current price lists.

In rejecting the woodworking machinery rule, which was No. 13, under Group II, the commission directed that the industry be advised that the commission, "in the present state of the law, cannot receive a resolution of the industry for the circulation of prices which is not confined to past transactions."

The resolution, which, with others, was published in *THE IRON AGE* of Dec. 20, 1928, page 1587, reads as follows:

"The industry hereby records its approval of the practice of distributing and circulating to the entire industry published current price lists, including all notices of advance or decline in prices made by any individual manufacturer, either by an individual manufacturer or by the associational group he may be identified with."

Group II rules are those which the commission considers only as ethical or sound business policies not involving unlawful practices and accepts as expressions of the trade without giv-

ing them its approval. Group I rules are those which the commission affirmatively approves.

The commission also rejected the last paragraph of Rule II, Group II, which read as follows:

"The industry further agrees that no price in excess of its fair market value shall be paid or allowed for any used machine thus offered for sale by the prospective customer or for a new machine."

### Will Not Approve Fixing of Trade-in Values for Used Machines

It is said the commission felt that in receiving a rule of this character it would be giving tacit approval to the fixing of trade-in values for used machinery.

Aside from these rejections, the commission accepted the rules as adopted at the conference. Rules appearing under Group I concern such practices as inducing breach of contract; false statements concerning a manufacturer's own product or concerning a competitor's product; secret rebates; price discrimination; adherence to published prices; sales of a new machine as a repossessed or rebuilt machine and paying commissions to employees of customers for the purpose of inducing sales.

Rules in Group II accepted as expressions of the trade have to do with such practices as granting of either selling commissions or dealer's discounts to other than an established dealer; confining sales to f.o.b. factory; regarding as separate transactions the acceptance of an old machine in part payment of the price of a new machine; guarantee against advance or decline and terms of sale.

The commission's statement said that the difference in estimates as to the percentage of the industry represented at the conference could not well be reconciled, but that from the list of appearances "it would seem that a preponderant majority was in attendance."

# Machinery Markets and News of the Works

## Tool Demand Unabated

Business Continues Good in All Sections and in Nearly All Industries—Deliveries Lengthening

**M**ACHINE tool business continues quite active in all of the leading industrial sections and in nearly all industries, with demand from some units of the automobile industry leading in volume. A subsidiary of the General Motors Corporation which is getting into production on a new model was one of the largest buyers of the past week. Among other buyers of fair-sized lots were the Timken Roller Bearing Co., Cleveland; the International Motor Truck Co., Plainfield and New Brunswick, N. J., and the Eaton Axle & Spring Co., Cleveland. The Goodyear Tire & Rubber Co., Akron, Ohio, has inquired for 20 or more machines for a maintenance department in connection with a new plant it is building at Gadsden, Ala., and the General Electric Co. is expected to distribute orders within a few days for its refrigerator department at Schenectady.

One of the features of the market is the revival of buying in New England. Orders have been received from diversified industries, including some manufacturers of textile machinery who have bought little or no shop equipment in the past few years.

Railroad inquiry is fairly active at Chicago, where the Santa Fe has added several machines to its recent list, while the Rock Island has inquired for eight motor-driven dry grinders and the Chicago, Milwaukee, St. Paul & Pacific for five lathes, two turret lathes, a boring mill, a milling machine and eight grinders.

Deliveries continue a major problem of the machine tool industry. Sales have been made of tools that will not be shipped until July, and, while this is an extreme case, promises of shipment range from six weeks to 10 weeks on many types of machinery.

## New York

**N**EW YORK, Feb. 11.—Machine tool business has continued during the past week at a rate about uniform with that of preceding weeks. Inquiries and orders are numerous. Local sellers express satisfaction with the volume of business they are receiving, and most of them are kept busy making quotations on prospective purchases. Longer deliveries are being quoted on some lines of tools, notably boring machines, and sales have been made of machines that will not be shipped until July.

Better buying in New England is one of the features of the market. Orders in that district come from widely diversified industries, but include textile machinery companies, some of which have bought practically no shop equipment in several years. The General Electric Co., is expected to release a number of orders for tools for its refrigerator department within a few days. The International Motor Co. has bought service tools for

its plants at Plainfield and New Brunswick, N. J.

Mill Basin Aircraft, Inc., Mill Basin, Brooklyn, is considering new one-story plant, to cost more than \$40,000 with equipment.

Liquid Carbonic Co., 3100 South Kedzie Avenue, Chicago, manufacturer of carbonating and bottling machinery, has acquired General Carbonic Co., manufacturer of kindred equipment, with plants in other cities, and will consolidate. Acquired plants will be continued and expansion carried out. Purchasing company will operate group of 26 plants in different parts of country.

Board of Education, Warwick, N. Y., is said to be planning installation of manual training equipment in new two-story junior and senior high school to cost \$275,000, for which bids will soon be asked on general contract. E. P. Valkenburg, 7 Linden Street, Middletown, N. Y., is architect.

William F. Regan, 72 Willoughby Avenue, Brooklyn, architect and engineer, has plans for two-story automobile service, repair and garage building, 100 x

100 ft., to cost about \$100,000 with equipment.

Todd Shipyards Corporation, 25 Broadway, New York, has work under way on new drydock at Erie Basin, Brooklyn, 715 ft. long and 113 ft. wide, to cost more than \$500,000 with equipment. Additional repair facilities will be provided.

American Smelting & Refining Co., 120 Broadway, New York, will carry out expansion program at plant at El Paso, Tex., to include new reverberatory furnace unit and auxiliary equipment, rebuilding existing copper smelting reverberatory furnace, installation of smoke eliminating equipment, etc., to cost more than \$650,000.

Interborough News Co., 244 West Forty-second Street, New York, has filed plans for six-story garage for company motor trucks and cars, to include machine and repair shop, paint shop and other departments, to cost about \$200,000 with equipment. Russell G. Cory, 30 Church Street, is architect and engineer.

Albany Steel & Hot Water Boiler Works, South Street, Rensselaer, N. Y., has asked bids on general contract for one-story addition, to be used in part for storage and distributing service, to cost about \$45,000 with equipment. P. J. Pagano, 61 Maiden Lane, Albany, is architect.

Fairchild Airplane Mfg. Co., 270 West Thirty-eighth Street, New York, has secured manufacturing rights from Armstrong, Siddeley, Ltd., London, England, for five-cylinder radial air-cooled aircraft engine in United States, rated at 80 hp., and will develop facilities for production at Farmingdale works.

Public Service Electric & Gas Co., Public Service Terminal, Newark, is arranging plans for construction of steel tower transmission lines to cost close to \$4,000,000, including two main lines, from Roseland to Lambertville, N. J., about 48 miles, and from Metuchen to Trenton, for connection with system of Philadelphia Electric Co.

Middlesex County Board of Vocational Education, New Brunswick, N. J., has plans for new vocational school to cost over \$125,000. Alexander Merchant, 52 Paterson Street, is architect.

Zenitherm Co., 390 Frelinghuysen Avenue, Newark, manufacturer of fireproof products, has awarded general contract to Robert Allen, Inc., 319 Mount Pleasant Avenue, for one and three-story addition, to cost more than \$200,000 with equipment. Fletcher-Thompson, Inc., 738 Broad Street, is architect and engineer.

Truss-Weld Barge Co., 95 River Street, Hoboken, N. J., A. D. Levenson, representative, recently organized, plans operation of local plant to manufacture new type of patented steel welded barge and tanker vessels. Johannes Kjekstad is one of heads of company, in charge of operations.

Paul J. Jossier, 242 Broad Avenue, Palisade Park, N. J., architect, is preparing plans for a one-story machine shop for company whose name is tem-

porarily withheld, to cost about \$25,000 with equipment.

Metal Welding Co., 338 Broad Street, Newark, N. J., has been organized to operate general welding and repair work including boilers, tanks, structural steel, heavy machine welding, pipe, etc. Shop at above address is completely equipped and no extensions are planned at present. Company is in market for electric arc-welding and acetylene welding and cutting equipment and arc and acetylene welding metal.

## Chicago

**C**HICAGO, Feb. 11.—Buyers' interest in machine tools is unabated. Fresh inquiries are numerous and a large volume of sales forecasts that delivery dates will be extended still further. Prices are firm.

The Santa Fe has added a 26-in. lathe, two 32-in. shapers, four grinders, two pipe machines, and a light forging hammer to its list. Rock Island will purchase eight motor-driven dry grinders, and the Chicago, Milwaukee, St. Paul & Pacific is in the market for five lathes, two turret lathes, a boring mill, a milling machine and eight grinders. Studebaker Corporation is moving its Detroit shops to South Bend, Ind., where it will produce a new line of 3-cylinder cars. Some old equipment is being rebuilt but many new machine tools are scheduled to be purchased.

Fire destroyed a manufacturing building at 701-25 Fulton Street, Chicago, with damage estimated at \$500,000. Among firms which suffered losses were American Printers Machinery Co., Groetchen Die & Tool Co., Joseph Landgraf & Co., tool manufacturers; American Tool Salvage Corporation and Gerrard Brass & Iron Works.

Scovill Mfg. Co., Chicago, has purchased property, 44 x 209 ft., at 1239 Washington Boulevard, and plans erection of a four-story warehouse.

Johnson Automobile, Wagon & Machine Co., 110 Harlem Avenue, has plans for two-story addition in machine shop, including improvements in present structure, to cost about \$35,000 with equipment. A. B. Malwurm, 1100 North Boulevard, is architect.

National Twist Drill & Tool Co., 26 South Jefferson Street, Chicago, will soon begin work on two-story addition, 25 x 100 ft., to cost about \$25,000, part of structure to be used for storage and distribution. H. A. Anderson & Co., 5 North La Salle Street, are architects.

Ritchie Mfg. Co., Inc., Marshalltown, Iowa, recently formed by Thomas Ritchie, Marshalltown, and associates, with capital of \$100,000, to manufacture valves, hydrants and kindred products, has plans for one-story factory, 60 x 120 ft., to cost about \$40,000 with equipment.

Gates Rubber Co., 999 South Broadway, Denver, has awarded general contract to Mead & Mount Construction Co., First National Bank Building, for new unit, 85 x 125 ft., to cost more than \$80,000 with equipment. John M. Gardner, 1342 Broadway, is architect.

Western Stoneware Co., Monmouth, Ill., plans rebuilding local plant No. 2, recently destroyed by fire.

Board of Education, 650 South Clark Street, Chicago, has plans for Lane technical high school to cost about \$3,000,000 with equipment. Paul Gerhardt, address noted, is architect.

## The Crane Market

**N**EW Inquiry for overhead traveling cranes is still small, except for a few lists of cranes, including 14 for the Baldwin Locomotive Works, Eddystone, Pa., and eight 1-ton hand power cranes for a Providence, R. I., manufacturer of machine tools. The Standard Oil Co. of New Jersey, 26 Broadway, New York, is inquiring for a 15-ton, 75-ft. span electric crane for shipment to Louisiana. Interest in locomotive cranes is still rather limited, but some substantial business is reported in prospect from the railroads and contractors.

In the Chicago district the Chicago, Milwaukee, St. Paul & Pacific Railroad is in the market for three 15-ton electric overhead cranes for Milwaukee. The Kearney & Trecker Corporation, Milwaukee, is inquiring for a 10-ton, 39-ft. span electric crane and the Allis-Chalmers Mfg. Co., Milwaukee, is about to buy a 15-ton electric overhead crane.

Among recent purchases are:

North Jersey Foundry Co., Little Falls, N. J., 5-ton, 30-ft. 7-in. span, 1-motor overhead crane from Box Crane & Hoist Corporation.

Buckingham Steel Co., Brooklyn, 3-ton, 26-ft. span, 2-motor overhead crane from Box Crane & Hoist Corporation.

United Electric Light & Power Co., New York, three 2-ton, 22-ft. span, 3-motor overhead cranes for Yonkers, N. Y., from Manning, Maxwell & Moore, Inc.

New York Central Railroad, New York, 15-ton gantry crane for shipment to Ohio, from Whiting Corporation.

Brown-Lipe-Chapin Division of General Motors Co., Syracuse, N. Y., 2-ton, 10-ft. span crane from H. D. Conkey & Co.

Line Material Co., South Milwaukee, 5-ton, 23-ft. 3-motor electric crane from H. D. Conkey & Co.

Consolidation Coal Co., June, W. Va., 5-ton, 33-ft. span, hand-power crane from H. D. Conkey & Co.

Consolidated Machine Tool Corporation, Rochester, N. Y., 3-ton, 20-ft. span, 3-motor crane from H. D. Conkey & Co.

Ames Shovel & Tool Co., North Easton, Mass., 2-ton, 30-ft. span, 3-motor, electric crane from H. D. Conkey & Co.

Illinois Electric Co., 314 West Madison Street, Chicago, electrical supplies and equipment, will soon begin superstructure for four-story and basement storage and distributing plant to cost about \$400,000 with equipment. S. N. Crowen and Associates, 22 West Monroe Street, are architects.

## New England

**B**OSTON, Feb. 11.—Current buying of new tools covers a wide range of equipment, with lathes, upright drills, milling machines and planers leading in activity. Some New England made lathes were sold the past week for June delivery, with no specific date guaranteed. Another New England lathe maker, heretofore comparatively inactive, has speeded up foundry melt and has let a sizable tonnage of castings, owing to an influx of orders from the Middle West. Used tools of moderate cost are selling in good volume, usually to shops in or near Bos-

ton. The higher priced used tools are going largely to dealers in New Jersey and the Middle West.

Sales of small tools so far this year are considerably ahead of those for the corresponding period last year. Extended deliveries are necessary on some types.

Fred Hudson, 197 Blackner Street, New Bedford, Mass., contemplates erection of a plant to manufacture dining cars. Details will be announced shortly.

North Shore Cutting & Die Co., 266 Broad Street, Lynn, Mass., will erect a one-story shop, 42 x 72 ft. Byron E. Porter, 73 Tremont Street, Boston, is architect.

City of Lynn, Mass., will purchase miscellaneous pumping plant equipment. Thomas W. Heath is chairman of water supply department.

J. D. Leland & Co., Statler Building, Boston, are preparing plans for a \$250,000 elementary school, at Watertown, Mass., to contain a manual training shop.

John Morrell & Co., 75 Commercial Street, Boston, meat packers, will build a two-story and basement plant, 90 x 115 ft., at Cambridge, Mass. Handling and fan equipment are required.

Arrow, Hartman, Hegeman Co. 103 Hawthorne Street, Hartford, Conn., electrical appliances, has plans for a two-story addition 100 x 250 ft. Mylchreest & Reynolds, 238 Palm Street, Hartford, are architects.

Plans will soon be ready for two one-story additions, 26 x 112 ft., and 156 x 250 ft., at Milford, Conn. for Wright & Corson Co., Bridgeport, Conn., rivets and brake lining. Fletcher Thompson, Inc., 542 Fairfield Avenue, Bridgeport, is engineer.

M. Swift & Son, 100 Love Lane, Hartford, Conn., have plans for a two-story, 55 x 75 ft. ice making plant, 25 x 40 ft. boiler house, and a coal pocket. Mylchreest & Reynolds, 238 Palm Street, Hartford, are architects.

Cutler-Hammer, Inc., Milwaukee, formerly Cutler-Hammer Mfg. Co., has acquired business of Trumbull Vanderpoel Electric Mfg. Co., Bantam, Conn., which will be operated as subsidiary under present name. This purchase will add complete line of meter service and safety switches to present Cutler-Hammer line of motor control, wiring devices and allied electrical items.

Blue Ribbon Service Co., Inc., 554 Fairfield Avenue, Bridgeport, Conn., operating a machine repair and brake testing works, is having plans drawn for one-story plant, 30 x 130 ft., with extension, 30 x 50 ft., to cost about \$45,000. F. J. Dixon, 945 Main Street, is architect.

American Electro-Metal Corporation, care of Chamber of Commerce, Lewiston, Me., affiliated with a company in Germany, has acquired about 15 acres on Lewiston Highway as site for new plant to manufacture electrical appliances. Initial works will cost about \$90,000. It is understood that Lockwood, Greene Engineers, Inc., 24 Federal Street, Boston, will prepare plans and supervise project.

## Philadelphia

**P**HILADELPHIA, Feb. 11.—Gulf Refining Co., Sydenham and Locust Streets, Philadelphia, has filed plans for storage and distributing plant on Penrose Ferry Road, including pumping plant and boiler house, to cost \$90,000 with equipment.

Bendix Brake Service Co., 3914 North Broad Street, Philadelphia, operated by

Bendix Brake Co., South Bend, Ind., manufacturer of brakes for automobiles, is completing plans for two-story factory branch, service and repair plant at Philadelphia, to cost about \$120,000 with equipment. H. G. Christman Co., 306 South Notre Dame Avenue, South Bend, is engineer.

Representing Board of Trustees, Eastern State Penitentiary, Graterford, Pa., Day & Zimmerman Engineering & Construction Co., 112 North Broad Street, Philadelphia, is asking bids until Feb. 19 for standard portable industrial steel building, 40 x 160 ft., and 12 ft. clear under trusses. Work will soon begin on machine shop, electrical, pipe and plumbing shops.

John J. Nesbitt, Inc., State Road and Rhawn Street, Philadelphia, manufacturer of ventilating equipment, etc., will soon take bids for one-story addition, 108 x 142 ft., to cost over \$80,000 with equipment. Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer.

Dixon Valve & Coupling Co., Emerald and Hagert Streets, Philadelphia, has taken over factory at Columbia Avenue and Hancock Street, on site, 108 x 200 ft., for expansion.

Board of Education, York, Pa., is considering installation of manual training equipment in new East End junior high school to cost about \$350,000, for which plans will be drawn by R. A. Stair, Jr., 100 East Market Street, architect.

York Steam Heating Co., York, Pa., operating central power house and system, plans extensions and improvements to cost more than \$100,000.

Board of Freeholders, Trenton, N. J., is arranging plans for new hangar, mechanical and repair shop, oil storage and other buildings, at Mercer Airport, to cost about \$40,000 with equipment. County Engineer Harris is in charge.

Board of Trustees, Pennsylvania Industrial Reformatory, Huntingdon, Pa., will receive bids until Feb. 23, for electric generator, steam engine, electric switchboard, etc., as per specifications at office noted, and office of I. H. Francis, 1520 Locust Street, Philadelphia, engineer.

Atlas Bearing Co., Philadelphia, on Feb. 15, will remove from 3945 North Reese Street to 2436 North Hope Street.

Frank L. Hawk Co., 105 Delancey Street, Philadelphia, has been organized to manufacture tools, such as pull points, wrecking bars, star drills and chisels for hand and electric hammers. Company does not expect to build plant. It purchases raw tool steel and octagon shapes.

## Buffalo

**B**UFFALO, Feb. 11.—Buffalo Nipple & Machine Co., Glenwood and duPont Avenues, Buffalo, is said to be planning one-story plant on Northland Avenue, to cost more than \$40,000 with equipment.

Co-Operative Grange League Federation Exchange, Inc., 42 East Avenue, Rochester, N. Y., has acquired property adjoining grain elevator of Pierce Elevator Corporation, Buffalo, recently purchased, and plans construction of new grain elevator to supplement Pierce unit, with elevating, conveying, screening and other equipment, to cost more than \$200,000. H. E. Babcock is general manager.

General Motors Corporation, Detroit, is negotiating for purchase of McKinnon Dash Co., 252 Amherst Street, Buffalo, and parent company, McKinnon Industries, Ltd., St. Catharines, Ont., manu-

facturers of gears, axles, hardware specialties, drop forging, etc., and will operate as unit of organization. Purchasing company plans expansion in present output.

Board of Education, City Hall, Birmingham, N. Y., contemplates installation of manual training equipment in four-story junior high school to cost about \$650,000. A. T. Lacey & Son, Press Building, are architects.

Elmwood & Ramsdell Corporation, Buffalo, recently organized by Wilton McD. Taylor, 120 Frontenac Avenue, and associates plans early operation of local plant to manufacture metal goods. Robert E. Molley, 2208 Elmwood Avenue, is also interested in company.

Buffalo, Niagara & Eastern Power Corporation, Electric Building, Buffalo, is arranging an expansion program to cost \$6,500,000, of which about \$1,390,000 will be used for extensions and improvements in power plants, including installation of additional equipment; \$1,194,000 has been appropriated for construction of steel tower and other transmission lines; \$1,585,000 for new automatic and other power substations; and distributing lines and system, to cost about \$5,065,000. William Kelly is vice-president, in charge of engineering.

Buffalo office of the Brown Instrument Co., Philadelphia, has been removed from 624 Ellicott Square to 402 Marine Trust Building.

## Cincinnati

**C**INCINNATI, Feb. 11.—Although sales have fallen off somewhat in the past week, machine tool builders report liberal bookings and heavy inquiries. Much of the current business still is being supplied by automobile companies or by companies allied with the automotive industry. The chief buyer the past few days has been one of the General Motors units which is getting into production on a new model. Orders from the general industrial field have been good, manufacturers of planers and boring mills having been among the leading companies obtaining business from that source.

Makers of special purpose tools are concentrating considerable attention on foreign trade, especially Europe and Russia. A local builder has sold three special lathes for delivery to Russia.

The problem of meeting delivery dates continues to vex local machine tool companies. Except in a few cases, builders are unable to furnish tools in less than six to eight weeks, and, in several instances, delivery has been extended to ten weeks. Machine tool plants are operating on heavy production schedules, and a number of shops are maintaining a night force in certain departments.

Schauer Machine Co., Cincinnati, recently incorporated with capital stock of \$100,000, has purchased Neil & Smith Electric Tool Co., 905 Broadway, and will manufacture portable drills and grinders, circular saws and screw drivers, which have been made for many years by latter company. L. Lee Schauer is president of new company, M. J. Byrns, vice-president, and L. C. Christopher, secretary. Mr. Schauer was associated with Cincinnati Bickford Tool Co. for 18 years, but during past two years has been with Lodge & Shipley Machine Tool Co.

Goehring Foundry Supply Co., 919 West Fifth Street, Cincinnati, recently formed, is now operating, manufacturing foundry facings and foundry supplies.

E. J. Goehring is president and William F. Hunsche, secretary-treasurer.

Cincinnati Electric Welders, Inc., 411 Poplar Street, Cincinnati, has been organized to manufacture electric welders. L. G. Palmer is general manager.

Contract has been let by Greaves Machine Co., Colerain Avenue, Cincinnati, to Austin Co., for one-story addition, 60 x 100 ft., to cost about \$35,000 with equipment.

Procter & Gamble Co., Cincinnati, is disposing of a preferred stock issue to total \$12,500,000, part of proceeds to be used for expansion, including construction of new plant at Baltimore to cost about \$4,000,000, for which bids are scheduled to be asked in about 30 days.

Transcontinental Air Transport, Inc., St. Louis, care of Love-Sultan, Inc., 6625 Delmar Boulevard, architect, has completed plans for Eastern terminal airport at Columbus, Ohio, including hangars, 120 x 200 ft., with lean-to, 20 x 200 ft., latter to include machine and repair shop, and other departments, to cost about \$90,000 with equipment.

Gulf Refining Co., Frick Annex, Pittsburgh, has acquired three-acre tract at Pulaski, Tenn., for new oil storage and distributing plant, to cost about \$40,000 with equipment. Project will include automobile service and repair building for company trucks.

Kentucky Electric Development Co., Breslin Building, Louisville, has plans for electric power plant and ice-manufacturing plant at Liberty, Ky., to cost about \$70,000.

Automatic bottling equipment, bottle and can-washing machinery, pasteurizing tanks, power, conveying and other equipment will be installed in addition to plant of Nashville Pure Milk Co., Church Street and Fourteenth Avenue, Nashville, Tenn., including improvements in present plant, to cost about \$180,000. Asmus & Clark, Nashville Trust Building, are architects.

Samuel Stamping & Enameling Co., Chattanooga, Tenn., has arranged for increase in capital by amount of \$100,000, practically entire fund to be used for expansion and improvements on which work is now in progress.

City Council, Maryville, Tenn., has plans for municipal electric light and power house to cost about \$200,000 with equipment. Bond issue will be arranged.

Hart, Freeland & Roberts, Independent Building, Nashville, Tenn., architects, are said to have plans for six-story automobile service, repair and garage building, to cost over \$100,000 with equipment.

## South Atlantic

**B**ALTIMORE, Feb. 11.—Bartgis Brothers Co., Hamburg and Bush Streets, Baltimore, manufacturer of folding boxes, corrugated paper products, etc., has asked bids on general contract for extensions and improvements in mill at Ilchester, Md., lately acquired, including one-story addition, project to cost more than \$70,000 with equipment. Fred L. Smith, 21 East Fortieth Street, New York, is engineer.

Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is disposing of bond issue of \$10,500,000, part of proceeds to be used for extensions and improvements in plants and system.

Joseph E. Sperry, Calvert Building, Baltimore, architect, has awarded general contract to Frainle Brothers & Haigley, 19 West Franklin Street, for six-story automobile service, repair and

garage building, to cost more than \$400,000 with equipment. H. F. Doelman, 516 North Charles Street, is engineer.

Black & Decker Mfg. Co., Towson, Md., manufacturer of electric drills and other tools, has begun erection of one-story addition, 200 x 200 ft., to be used in part for foundry, to cost about \$100,000 with equipment.

Chesapeake & Ohio Railroad Co., Richmond, Va., has authorized fund of \$3,160,000 for construction of new car repair shops at Russell, Ky., to handle 1000 cars per month; also appropriation of \$3,490,000 for extensions and rebuilding locomotive shops at Huntington, W. Va., and installation of equipment; and \$819,000 for additions to engine house and shops at Richmond, and extensions in repair shops on Seventeenth Street.

City engineering department, City Hall, Baltimore, C. F. Goob, chief engineer, is completing plans for first unit of municipal airport on waterfront, vicinity of Dundalk, including hangars, machine shops, and other buildings, to cost more than \$1,000,000. Project will represent investment of about \$3,500,000.

Tide Water Power Co., Wilmington, N. C., is disposing of bond issue of \$5,300,000, part of proceeds to be used for extensions and improvements in power plants and system, including acquisition of additional properties.

Hardaway Construction Co., Independence Building, Charlotte, N. C., plans new plant at Winston-Salem, N. C., for production of ready-mixed concrete, to cost \$45,000, including concrete mixers, bins, elevating, conveying and other equipment.

City Gas Co., Norfolk, Va., plans extensions in artificial gas plant and system, including additional pipe lines, to cost more than \$100,000 with equipment.

## Milwaukee

MILWAUKEE, Feb. 11.—Demand for machine tools continues active and well distributed. Most shops find selling a much lesser problem than making deliveries on old orders. Shops are being operated at the highest rate ever known in a more or less futile effort to respond to the insistent call that shipments be made according to schedules. The metal trades are mainly responsible for further gains in employment. February shows 40,707 on the payrolls of 50 typical shops which reported 38,995 at work in January, the gain being the greatest for any month since surveys were started nine years ago. A year ago employment figures were 35,493.

Members of Invincible Metal Furniture Co., Manitowoc, Wis., which engaged in production of airplanes several months ago, have organized Invincible Aircraft Corporation, with \$500,000 capital. Plans are under way to build a three-story extension to present plant, to cost about \$200,000 with equipment. J. A. Schuette is president.

Crucible Steel Casting Co., 1330 Fifteenth Avenue, Milwaukee, has placed contract with the Rauff Co., 428 Wisconsin Avenue, local, for one-story shop addition, 40 x 122 ft. Albert T. Lange is president and general manager.

Wisconsin Gas & Electric Co., Racine, Wis., is about to take bids for a new gas holder, 155 ft. high, and 175 ft. in diameter, with capacity of 3,000,000 cu.

ft., to cost about \$200,000. D. E. Callender is vice-president and general manager.

American Metal Products Co., 1348 Burnham Street, Milwaukee, expects to start work about March 1 on a brick and steel rolling mill addition, 50 x 120 ft.

Great Lakes Coal & Dock Co., 228 Plymouth Building, Minneapolis, has placed contract with Mead-Morrison Mfg. Co., East Boston, Mass., for a new coal handling bridge at Superior, Wis. It will be 442 ft. long and 70 ft. high, and have a screening plant.

Prentice-Wabers Mfg. Co., Wisconsin Rapids, Wis., placed contract with Frank J. Henry, 430 North Fifth Street, local, for a one-story factory addition, 50 x 150 ft. Company manufactures gasoline camp stoves, metal camping equipment, etc. Ralph Wiltout is general manager.

## Pittsburgh

PITTSBURGH, Feb. 11.—Bids have been asked by Thomas Flexible Coupling Co., Warren National Bank Building, Warren, Pa., for one-story plant, to cost about \$45,000 with equipment.

Board of County Commissioners, City-County Building, Pittsburgh, has authorized fund of \$133,000 for purchase of tractors, 15-ton rollers, dump trucks, and other motor vehicles and equipment for road department.

Pittsburgh Carbon Brush Co., 127 Fancourt Street, Pittsburgh, manufacturer of electrical products, has plans for one-story addition, 75 x 90 ft., to cost about \$35,000.

Board of Education, Sharon, Pa., is considering installation of manual training equipment in new three-story junior high school to cost about \$400,000, for which bids will soon be asked on general contract. Clepper & Clepper, McDowell National Bank Building, are architects.

United Pocahontas Coal Co., Connellsville, Pa., Worth Kilpatrick, president, is said to be planning erection of all-steel tippie, with mechanical coal-washing and cleaning plant at Crumpler, W. Va., to cost about \$200,000 with equipment.

City Council, Moundsville, W. Va., is considering establishment of municipal airport, with hangars, reconditioning and repair shops, oil storage and other buildings, to cost about \$40,000 with equipment.

Board of Education, Midland, Pa., has authorized installation of vocational training shops in three-story addition to Lincoln high school, to cost about \$80,000. W. G. Eckles Co., New Castle, Pa., is architect.

## Cleveland

CLEVELAND, Feb. 11.—Machinery sales were fair the past week in single tool orders and inquiry is holding up well. Demand is largely for specialized production machinery used in the automotive industry. The Goodyear Tire & Rubber Co., Akron, will require considerable equipment for a maintenance department that it will provide for the new plant it is building at Gadsden, Ala., and has issued a tentative list of 20 or more machines.

The Timken Roller Bearing Co., Can-

ton, bought a few tools the past week and is figuring on some special machinery. The Eaton Axle & Spring Co., Cleveland, which recently bought considerable machinery for its plant extension, has purchased a few additional tools.

Alloy Cast Steel Co., Marion, Ohio, manufacturer of steel castings, has let contracts for buildings which will increase present floor space more than 50 per cent. Additional melting unit will be installed which will practically double capacity of 250 tons per month. Added capacity will be for both large and small steel castings to be furnished in regular steels and alloys to customers' specifications.

Embry-Riddle Co., Lunken Airport, Cincinnati, has taken options on property at Ironton, Ohio, for new airport and flying school, consisting of hangars, repair shops and other buildings, to cost more than \$75,000 with equipment.

Board of Education, Canton, Ohio, is considering installation of manual training equipment in two-story high school at North Canton, to cost about \$240,000, for which plans are being drawn by F. C. Medicus and J. H. Samuels, 211 Chapel Street, Youngstown, architects.

Electric Auto-Lite Co., Toledo, Ohio, has acquired storage battery division of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and will operate as division of its organization. Plans have been approved for expanding capacity of plant from 300 to 1000 electric battery units per day.

Manufacturers' Brush Co., 1950 West 114th Street, Cleveland, has taken bids on general contract for one-story unit, 75 x 235 ft., to cost about \$70,000 with equipment.

Consolidated Cartage & Storage Co., 1292 West Third Street, Cleveland, has filed plans for one-story service, repair and garage building, 120 x 175 ft., for company motor trucks and cars, to cost about \$70,000 with equipment.

## Detroit

DETROIT, Feb. 11.—Following purchase of former foundry of Buhl Malleable Co., Detroit, McManus Steel & Iron Co., 2390 Wight Avenue, has plans for extensions and improvements to cost about \$50,000, and will convert for storage and distributing expansion. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Officials of Everett Plano Co., South Haven, Mich., including John H. Parnham and J. L. Barron, president and vice-president, respectively, have acquired substantial interest in Howard Radio Co., 4949 North Crawford Avenue, Chicago. Plans are being arranged for removal of Howard works to South Haven, with additional equipment for enlarged output.

City Council, Detroit, has approved construction of hangars, mechanical and repair shops, oil storage and other buildings at municipal airport at Gratiot and Connors Avenues, to cost \$1,416,470 with equipment. City engineering department, City Hall, is in charge.

All-Metal Products Co., Wyandotte, Mich., will take bids in about 30 days for one-story addition, 125 x 500 ft., to cost about \$175,000 with equipment.

Detroit Edison Co., 2000 Second Avenue, Detroit, has authorized increase in capital from \$120,000,000 to \$150,000,000, part of proceeds to be used for expansion in plants and transmission system.

Warner Aircraft Corporation, 4042 West Jefferson Avenue, Detroit, has en-

gaged C. W. Brandt, Francis Palms Building, engineer, to prepare plans for new one and two-story plant for parts production and assembling, to cost about \$400,000 with equipment.

Board of Education, Grand Rapids, Mich., has plans for four-story vocational and technical high school to cost about \$500,000 with equipment, and expects to ask bids soon on general contract. Turner & Thebaud, Michigan Trust Building, is architect; W. W. Bradfield, same address, is engineer.

Schulte Mfg. Co., 6910 Lafayette Avenue, East, Detroit, manufacturer of furniture, has leased factory property totaling about 35,000 sq. ft. floor space, for expansion.

Peerless Egyptian Cement Co., Port Huron, Mich., has begun expansion at local mill, to cost about \$125,000 with equipment.

Motor City Sales Co., 676 West Grand Boulevard, Detroit, has been organized to act as sales and service representative in Detroit territory for American Nut Co., Detroit, manufacturer of bar nuts; Cuyahoga Steel & Wire Co., Cleveland, maker of cold drawn steels, and D. A. Stuart & Co., Chicago, manufacturers of time tested cutting oils. J. C. Wilkie, president American Nut Co., is secretary and treasurer of new company.

Scott Valve Mfg. Co., 3963 McKinley Avenue, Detroit, formerly Roe Stephens Mfg. Co., has been reorganized and facilities will be increased for manufacture and distribution of Scott valves. Officers are Alexander Gow, president; John A. Baas, vice-president; A. DeLong Thomas, secretary, and Guy C. Powell, treasurer.

## Indiana

INDIANAPOLIS, Feb. 11.—Steinite Radio Co., Atchison, Kan., and 506 South Wabash Avenue, Chicago, has asked bids on general contract for new plant at Fort Wayne, to cost about \$400,000 with equipment.

Muncie Gear Works, Muncie, is said to be planning one-story addition to cost about \$45,000 with equipment. It is understood that work will begin in spring.

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has filed plans for two-story service, repair and sales building, 75 x 135 ft., at Indianapolis, to cost about \$130,000 with equipment, to be operated by Jones-Whitaker Sales Co., local representative.

In connection with removal of Apex radio works from Chicago to Marion, recently reported, United States Radio & Television Corporation, Marion, has authorized plans for two one-story additions to Case radio plant, to cost about \$50,000.

Plymouth Body Works, 114-22 LaPorte Street, Plymouth, manufacturer of commercial automobile bodies, is planning one-story addition to cost about \$55,000 with equipment. Frank Cullison is president.

## Gulf States

BIRMINGHAM, Feb. 11.—Brown Paper Mill Co., Monroe, La., expects to ask bids soon on one-story addition, to cost about \$100,000 including equipment.

City council, Breckenridge, Tex., is considering a municipal airport, to include hangars, repair and reconditioning shop and other buildings to cost more than \$45,000.

Clarksdale Machinery Co., Clarksdale, Miss., plans one-story addition to cost about \$35,000 with equipment.

Texas-Louisiana Power Co., Houston, Tex., is disposing of bond issue of \$3,000,000, part of proceeds to be used for extensions and improvements in plants and system, including acquisition of additional properties.

Acme Brick Co., N. P. Anderson Building, Fort Worth, Tex., plans expansion at plant at Malvern, Ark., including installation of mixing machinery, conveying apparatus, presses and other equipment for production of face brick, to cost about \$200,000.

Asiatic Petroleum Co., Ltd., 65 Broadway, New York, is said to have plans for additions in oil storage and distributing plant at Port Tampa, Tampa, Fla., including new power house, to cost about \$225,000.

Houston Gulf Gas Co., Houston, Tex., operating natural gas properties, will carry out expansion program, including pipe lines and other facilities, to cost more than \$200,000.

N. W. Overstreet, Mississippi Fire Insurance Building, Jackson, Miss., architect, will soon take bids on general contract for four-story automobile service, repair and garage building, to cost about \$100,000 with equipment.

McDonald Tractor Equipment Co., Orlando, Fla., will build one-story storage and distributing plant, 60 x 130 ft., with repair facilities, to cost about \$30,000.

Charles S. Wallace, Morehead City, N. C., and associates have organized Mayport Fisheries Co. to construct a plant at Mayport, Fla., for production of fertilizer products, oil, etc., to cost more than \$150,000 with equipment.

Board of Education, Clarksdale, Miss., contemplates installation of manual training equipment in new junior high school to cost more than \$200,000, for which bids have been asked on general contract. P. J. Krouse, M. & W. Building, Meridian, Miss., is architect.

City Council, Beaumont, Tex., J. W. Anderson, city manager, is arranging fund of \$100,000 for municipal airport to include hangars, repair shop and other buildings.

## St. Louis

ST. LOUIS, Feb. 11.—Plans are being considered by Baldwin Harvester Co., 1801 McGee Street, Kansas City, Mo., for one-story factory at North Kansas City, to cost about \$40,000 with equipment.

Manske & Bartling, 4526 Olive Street, St. Louis, architects, have asked bids for five-story and basement automobile service, repair and garage building, 60 x 105 ft., to cost about \$115,000 including equipment.

Von Hoffman Flying School, Anglum, St. Louis, plans construction of two new steel hangars, with repair and reconditioning departments, at Lambert-St. Louis airport, to cost more than \$45,000 with equipment.

Phoenix Cotton Oil Mill Co., Walnut Ridge, Ark., plans rebuilding part of mill recently destroyed by fire.

Common Council, Columbia, Mo., has plans for extensions and improvements in municipal electric light and power plant, including installation of 5000-kva. turbine unit, condenser, switchboard and accessory equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Knoll Aircraft Corporation, 471 West

First Street, Wichita, Kan., has awarded general contract to George Sledhoff Construction Co., Broadview Hotel Building, to cost about \$90,000 with equipment.

Wagner Electric Co., 6400 Plymouth Avenue, St. Louis, manufacturer of motors and parts, has awarded general contract to Hercules Contracting Co., Wainwright Building, for one and five-story addition, 120 x 400 ft., to cost more than \$200,000 with equipment.

## Pacific Coast

SAN FRANCISCO, Feb. 7.—Commercial Aircraft Corporation, care of W. M. Griffith, Altadena, Cal., recently organized, has engaged Mark M. Falk, Washington Building, Los Angeles, architect, to prepare plans for works near new Metropolitan airport, consisting of one-story parts and assembling units, 85 x 225 ft., and two smaller structures, 30 x 60 ft. and 50 x 50 ft., to cost about \$65,000 with equipment.

Board of Education, San Diego, Cal., has authorized one-story vocational training shop at new East San Diego high school group, project to cost about \$400,000 with equipment. T. C. Kistner & Co., Architects Building, Los Angeles, and Spreckles Building, San Diego, are architects.

City Council, Alturas, Cal., is considering municipal electric light and power plant to cost about \$75,000 with equipment.

Tyre Brothers Glass Co., Thirty-first and San Pedro Streets, Los Angeles, manufacturer of sheet glass, has purchased property on Van Ness Avenue, Fresno, Cal., 80 x 150 ft., for new plant to manufacture shatterproof glass, to cost more than \$90,000 with equipment.

Board of Trustees, University of Washington, Seattle, has authorized plans for two-story and basement aeronautics building, 80 x 160 ft., with extension, 42 x 56 ft., to cost \$290,000, of which \$50,000 will be expended for equipment. John Graham, Dexter Horton Building, is architect.

Consolidated Plywood & Lumber Co., Aberdeen, Wash., G. A. McChesney, manager, has plans for new mill on Elliott waterway, consisting of main unit, 50 x 500 ft., power plant, 40 x 60 ft., and storage and distributing plant, 50 x 200 ft., to cost more than \$200,000 with machinery.

Standard Oil Co. of California, Los Angeles, has secured permission for gasoline refinery in Potrero oilfield, near Inglewood, to cost about \$110,000 with equipment.

## Canada

TORONTO, Feb. 11.—A good demand for machine tools is reported by dealers and builders. Practically all manufacturing industries are showing interest in the market and there is a steady flow of replacement orders covering all lines of equipment.

Total investment in Canada's electrical industry, according to the February letter of the Royal Bank of Canada, is nearly a billion dollars. In 1910 it was only \$121,000,000. Plants now under construction call for a further investment of \$200,000,000 for construction, machinery, transmission and distribution.

Chrysler Corporation is preparing to build another unit at Walkerville, Ont., in connection with its \$5,000,000 program. First unit, costing \$1,500,000, is

nearing completion, and installation of machinery will start about March 1.

James McLaren Lumber Co., Buckingham, Que., will build a 250-ton paper mill and 75-ton sulphite mill to cost about \$6,000,000. Construction contract has been awarded to Foundation Co., Montreal. Power for mills will be derived from High Falls 90,000-hp., development of McLaren company, now under way.

Matthews Conveyor Co., Port Hope, Ont., will call for bids about March 1, for a \$20,000 addition to its plant.

J. T. Findlay, architect, St. Thomas, Ont., is receiving bids for erection of a \$30,000 addition to the plant of the St. Thomas Metal Signs.

National Steel Car Corporation, Hamilton, Ont., has awarded contract to Parklap, Ltd., 541 Ouellette Avenue, Windsor, Ont., for one-story addition, 90 x 100 ft. to coach plant. Steel contract has been let to Hamilton Bridge Co. Plant extensions in prospect and under way involve an expenditure of about \$1,750,000.

John G. Kent & Son, Ltd., 1130 Bay Street, Toronto, has been awarded contract by Shipway Iron Co., 700 Wellington Street West, Toronto, for a one-story factory, 50 x 110 ft., at Leaside, Ont., to cost \$25,000. E. A. Leigh, 1205 Bay Street, Toronto, is architect.

Fraser-Brace, Ltd., 107 Craig Street West, Montreal, has contract for construction of a two-story refinery, 75 x 100 ft., for International Nickel Co., at Port Colborne, Ont.

Russell Construction Co., Ltd., Harbor Commissioners Building, Toronto, have been awarded contract by Rogers Batteryless Radio Co., Toronto, for erection of a \$200,000 plant, 82 x 250 ft.

Smith & Stone, Ltd., Georgetown, Ont., manufacturer of electrical supplies, etc., is planning an addition to cost \$35,000.

Hydro Electric Power Commission of Ontario, University Avenue, Toronto, plans construction of a power house at Ear Falls, Ont., on English River, to cost \$1,000,000.

#### Western Canada

Carter-Halls-Aldinger Co., Ltd., Royal Bank Building, Winnipeg, has been awarded contract for one-story plant, 100 x 275 ft., for Service Station Equipment Co., Ltd., Toronto.

Robertson & Hackett have purchased property of defunct Pacific Box Co., Vancouver, B. C., and will spend \$250,000 on new equipment.

## Foreign

IN connection with Dnieper River hydroelectric power project of Soviet Russian Government, Moscow, on which work has been started, a group of engineers has come to United States, headed by A. V. Winter, chief engineer, to make purchases of turbine units and other machinery for initial plant. Ultimate station will have capacity of 800,000 hp., and will cost more than \$60,000,000. Hugh L. Cooper & Co., 101 Park Avenue, New York, are consulting engineers. Amtorg Trading Corporation, 165 Broadway, is official buying agency for Soviet Government, and it is understood that engineering delegation will make headquarters at last noted address.

A company at Rio de Janeiro, Brazil, is planning construction of plant at Porto Alegre, Brazil, to manufacture sulphuric acid, superphosphates, etc., to cost about \$360,000. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference Brazil No. 298165.

Brazilian Traction, Light & Power Co., Rio de Janeiro, is arranging an expansion and improvement program, including installation of additional equipment at

Parahyba generating station in Rio district, and extensions in power plant at Serra in Sao Paulo district, with additional transmission lines, switching stations, and other facilities. Company has acquired City of Santos Improvement Co., Santos, Sao Paulo, at cost reported at \$14,000,000, and will make extensions and betterments in these properties. Miller Lash is president.

Ford Motor Co., Detroit, has secured 25-year concession from Turkish Govern-

ment, Constantinople, for construction and operation of an assembling plant for Ford automobiles, and will proceed with project soon.

Smal & Co., machine tools, 18 Rue de l'Autonomie, Brussels (Midi), Belgium, desires drawings and other particulars for a plant to be built in Belgium to manufacture galvanized corrugated sheets. Besides the dipping apparatus, information is wanted respecting presses and, incidentally, machinery and equipment.

## Fabricated Structural Steel

Awards of Only 17,700 Tons—New Projects Call for 33,000 Tons

AWARDS reported during the week amounted to only 17,700 tons, one of the lowest weekly totals of the year, while new projects out for bids totaled 33,000 tons. Included in the latter tonnage were a railroad office building in Philadelphia calling for 10,000 tons and a bridge at Indianapolis which will take 5000 tons. Awards follow:

BEACON, N. Y., 1450 tons, building for National Biscuit Co., to American Bridge Co.

NEW YORK, 430 tons, apartment building at Second Avenue and Fifty-third Street, to McClintic-Marshall Co.

NEW YORK, 400 tons, store building at Sixth Avenue and Thirty-second Street, to Hinkle Steel Construction Co.

PHILADELPHIA, 200 tons, building for John T. Lewis Co., to Robinson Iron & Steel Co.

PENSACOLA, FLA., 450 tons, Louisville & Nashville Railroad warehouse, to Virginia Bridge & Iron Co.

SOUTHERN RAILWAY, 400 tons, bridge in Kentucky, to Virginia Bridge & Iron Co.

PITTSBURGH, 278 tons, bracing for piling, Duquesne Light Co., power plant extension, to Jones & Laughlin Steel Corporation.

PITTSBURGH, 2500 tons, transmission towers for West Penn Power Co., to Blaw-Knox Co.

DETROIT, 900 tons, Michigan Alkali Co., to unnamed fabricator.

DETROIT, 1000 tons, Candler sub-station for Detroit Edison Co., to American Bridge Co.

DETROIT, 450 tons, Michigan Bell Telephone Exchange, to Russell Steel Co.

DETROIT, 137 tons, St. James parish auditorium, to Gilbert Steel Co.

MILWAUKEE, 150 tons, apartment building for Otto F. Priebe, to Milwaukee Structural Steel Co.

CHICAGO, 3000 tons, McChesney building, to Gage Structural Steel Co.

CHICAGO, 1000 tons, American Bankers Insurance Co. building, to Duffin Iron Co.

CHICAGO, 150 tons, St. Phillips school and church building, to A. Bolter's Sons.

FOREST PARK, ILL., 225 tons, building for Borden Farm Products Co., to Midland Structural Steel Co., Chicago.

EAST ST. LOUIS, ILL., 200 tons, building, to Stupp Brothers, St. Louis.

ST. LOUIS, Transcontinental Air Transport Co., 200 tons, hangars, to Mississippi Valley Structural Steel Co.

ST. LOUIS, 2100 tons, building for Continental Life Insurance Co., to Mississippi Valley Structural Steel Co.

BEVERLY HILLS, CAL., 687 tons, building for California National Bank, to Consolidated Steel Corporation.

SACRAMENTO, CAL., 150 tons, school on Fourth Street, to Moore Dry Dock Co.

ALTURAS, CAL., 1000 tons, sawmill for Pickering Lumber Co., to Worden-Allen Co.

SEATTLE, 100 tons, Kenworth Motor Truck Co. plant, to Wallace Bridge & Structural Steel Co.

GLENDAL, CAL., 104 tons, plates, 30-in. riveted steel pipe, to Lacy Mfg. Co.

#### Structural Projects Pending

Inquiries for fabricated steel work include the following:

WORCESTER, MASS., 700 tons, General Baking Co. building.

ORANGE, CONN., 500 tons, printing plant. PROVIDENCE, R. I., 125 tons, Providence National Bank building.

STATE OF VERMONT, 130 tons, three bridges.

BINGHAMTON, N. Y., 500 tons, First National Bank Building.

BAYWAY, N. J., 500 tons, mill building for National Electric Co.

AKRON, 1000 tons, Ohio Bell Telephone Co. building.

PENNSYLVANIA RAILROAD, 10,000 tons, office building in Philadelphia.

INDIANAPOLIS, 5000 tons, bridge for Indianapolis Union Railway Co.

SOUTHPORT, IND., 250 tons, high school. ST. PAUL, MINN., tonnage not stated, addition to First National Bank Building.

CHAMPAIGN, ILL., 300 tons, skating rink for University of Illinois; Holabird & Roche, architects.

DECATUR, ILL., 1000 tons, office building for Citizens Building Corporation.

CHICAGO, 800 tons, apartment building at 1200 Stone Street; Smith & Brown, architects.

CHICAGO, 500 tons, Eckhart laboratory for University of Chicago; Charles J. Klauder, architect.

CHICAGO, 350 tons, building for Swift & Co.; J. B. French Co., general contractor.

CHICAGO, 1500 tons, addition to Franklin Building of Illinois Bell Telephone Co.; Holabird & Roche, architects.

SOUTH CHICAGO, 2500 tons, mill building for Interstate Iron & Steel Co.

MILWAUKEE, 1400 tons, shop for Chicago, Milwaukee, St. Paul & Pacific.

MILWAUKEE, 400 tons, store and office building for Franklin Building Co.; bids close Feb. 14.

DULUTH, MISSISSIPPI & NORTHERN RAILWAY, 1800 tons, girder span.

COLDWATER, ARIZ., 450 tons, highway bridge.

WICHITA, KAN., 500 tons, Kress Building. INTERNATIONAL, UTAH, 600 tons, building for Anaconda Copper Mining Co.

SPOKANE, WASH., 1970 tons plates, 36 and 48-in. welded pipe; bids being taken.

SEATTLE, 160 tons, addition to Rainier Club; bids being taken.

OAKLAND, CAL., 250 tons, plant for Western Electric Co.; bids opened.